PANZERWAFFE TARNFARBEN

Camouflage Colours and Organization of the German Armoured Force (1917-1945)

Abteilung 502

Carlos de Diego Vaquerizo

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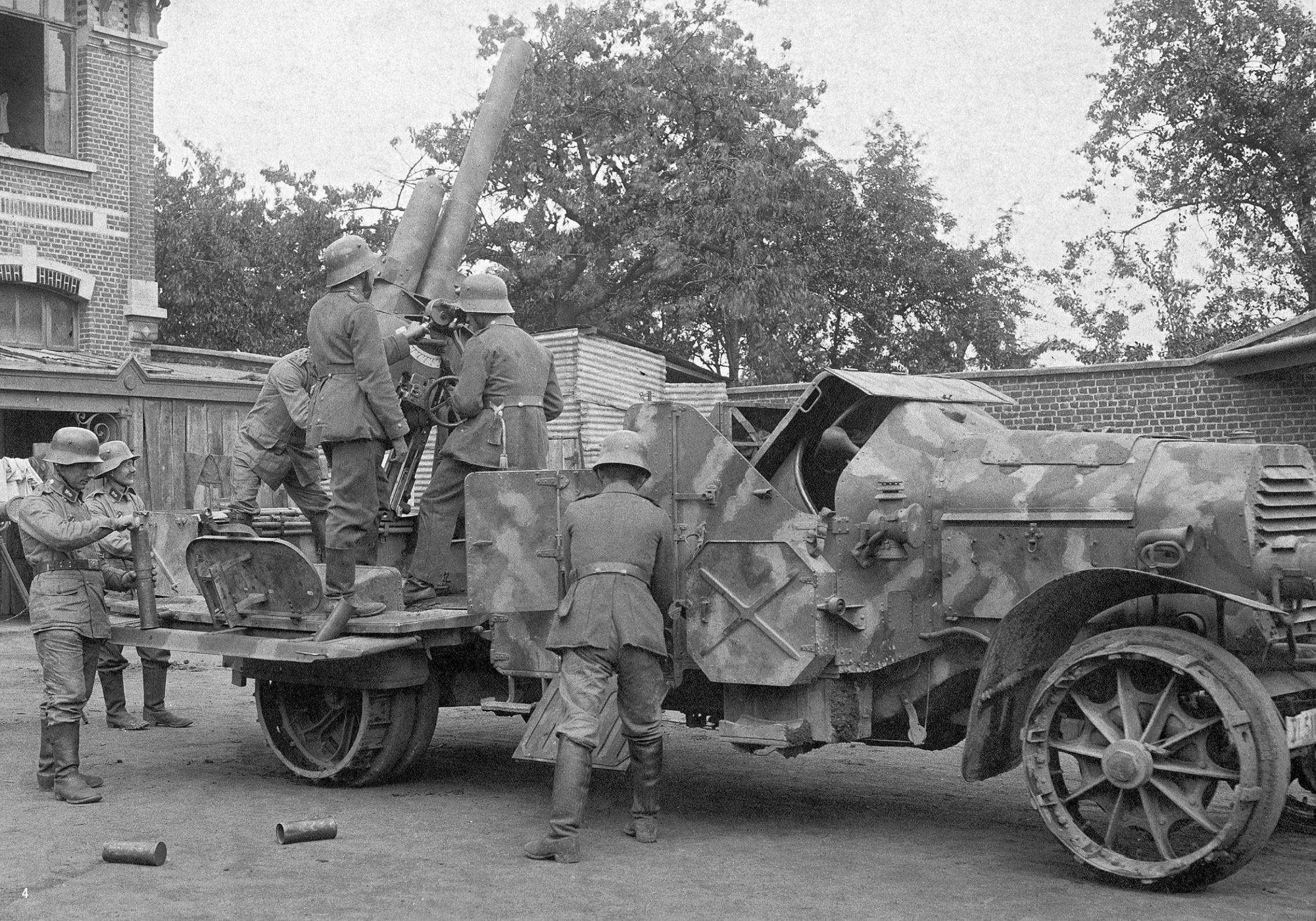

THE GREAT WAR AND THE INTERWAR PERIOD

During the first years of the 20th century the great European powers were gradually equipping their armies with neutral-mute-faded-dull coloured uniforms in order to hide the forces in front of their enemies. This idea extended to material: further studies on that matter were carried out during World War I. We can state that Germans settled the bases of camouflages for the next III Reich Panzerwaffe *(armoured force).*

Because of the outstanding destroying capability and the long range of these new weapons, by the end of the 19th century, the *Reichsheer* High Command (Imperial Army named *Deutsches Heer* which means German Army) was well aware that the campaign uniforms had to go unnoticed and had to blend with the environment when in combat. In 1892, some helmet-covers made from 'reed-green' fabric were adopted; two years later grey coats were put to use too. In 1897, *Jäger* mounted troops (Light Infantry) were equipped with *Graugrün* uniforms (greyish green); from 1901 the same shade was in use for all machine-gun detachments. In 1900, the troops of the Chinese Expeditionary Corps were equipped with some summer *Khaki* uniforms slightly reminding British ones and also with winter uniforms made from greenish grey fabric named *Feldgrau* (that literally means campaign grey) which would also be in use in Europe. During the 1905-1906 period there were tests carried out in Germany with different uniforms of *Graugrün*, *Grau* (grey) and *Feldgrau.* It soon became evident that the best shade, when in campaign, was the *Feldgrau* one. On 14th February 1907 it was stated that the next uniforms would be made using *Feldgrau* fabric, except the ones given to light infantry or *Jäger* (these troops would be wearing *Graugrün* clothes, and the regulations included officers and machine-gun units). In February 1910, it was equally ordered the use of *Feldgrau* fabric to make any campaign uniform for officers. As Germany entered

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In the previous page. *Kraftwagen 14* truck made by Daimler (also named *Platformwagen*). There is a 77-mm, 27 calibre long antiaircraft gun installed in the rear platform which had been built by Krupp. More precisely, this was a *7.7-cm Flugabwehrkanone L/27* gun. The camouflage scheme is made up of irregular *Ocker* and *Braun* blotches applied with a paintbrush onto the standard *Feldgrau*. (Archives Ricardo Recio)

In this page. Steel helmet (*Stahlhelm*) model 1916 with a camouflage scheme achieved with a paintbrush. Onto the *Feldgrau* layer some *Ocker* and *Braun* blotches have been outlined using black paint. When this helmet was painted, at the end of World War I, the shades were lighter. It is necessary to point out that the pigments tend to get darker over the years. (Collection Overlord 1944)

the war on 1st August 1914, all uniforms given to recruited personnel and sent to the battlefront (except the aforementioned ones) were made of *Feldgrau* fabric. This colour was in use (with minor changes) until 1945.

World War I

As far as the *Reichsheer* material is concerned, for the whole WWI the Germans used *Feldgrau* colour as a universal shade. This was employed to paint both light and heavy weaponry, artillery, wagons, automobile vehicles (along with metallic pieces which were a part of campaign equipment). Unlike uniforms, this *Feldgrau* hue could vary from dark olive green (slightly greyish or even greyish brown) to light greenish grey (a range with so many nuances anyway). It depended on the manufacturer, the paint batch or the available pigments… There was no rigorous ruling related to paint standards in the Army.

Once the Western Front got stabilized in 1915, the Germans following the French warfare started to camouflage their artillery guns for those to go as much unnoticed as possible. The Frenchs did not adopt uniforms matching the new times until December 1914 but led the researches related to the decomposition of shapes through the use of paints and applied this knowledge to all war material. They worked with well-known artists fond of cubist techniques so, in February 1915, the first official team of *'camoufleurs'* was put into action. In fact, those artists coined the word '*camouflage',* a much familiar word to all of us nowadays. On the other hand, the German Command allowed the units to perform all necessary works for a perfect camouflage, taking into consideration the environmental characteristics and, most of the time, using all available paints.

Later (probably between 1916 and 1917), the *Reichsheer* Command agreed on conducting further researches about camouflages in order to improve efficiency and rule their use. Some tests were carried out, the mimicked pieces were under air monitoring. It was stated that a few colours such as *Weiss* (white), *Hellgelbe* (light yellow) or *Hellblau* (light blue) were not the right ones while there were some pretty efficient shades like *Ocker* (ochre), *Grün* (green) and *Braun* (brown): these showed to be excellent for the artillery guns to go unnoticed.

According to these studies, the pieces were added some irregular blotches using those three colours (or merely two of these) although the surfaces were not completely covered as the standard *Feldgrau* had to show underneath. These smudges or blotches could be separated by some *Schwarz* (black) lines (one or two fingers wide). The range (as it had happened with *Feldgrau*), was large enough with a bunch of nuances. *Grün* colour could be medium green or dark green, *Braun* was dark chestnut brown or medium brown and finally *Ocker* could be ochre or sand or even yellowish clay. Sometimes, two different nuances of the same colour were used for a single camouflage scheme.

In this page. *Beutepanzer Mk. IV Female* "Dora" tank camouflaged with the following colours: *Feldgrau, Ocker* and *Braun*. The *Eisernes Kreuz* was painted in the roof, the front and the rear parts and in both sides while the chassis number (see the figures "117") was labelled inside the doors. (Archives Ricardo Recio)

In the following page. The *A7V* were already camouflaged in the *B.A.K.P. 20.* workshops and each one had a unique scheme. After any combat action the tanks were tested in these premises and were repainted (totally or partially) (The Tank Museum, Bovington)

There was a much interesting pattern, commonly used to camouflage artillery guns, made up of rows of light and dark spots of two or even more colours applied onto a *Feldgrau* background. This showed to be a pretty efficient pattern, quite easy to make just using a rag (in case there was no paintbrush available). The more elaborated variant of this particular scheme roughly reminded the *Deutsche Luftstreitkräfte*'s *Lozenge* (German Air Force), adopted late 1916, that consisted of four-or-five-colour polygonal blotches.

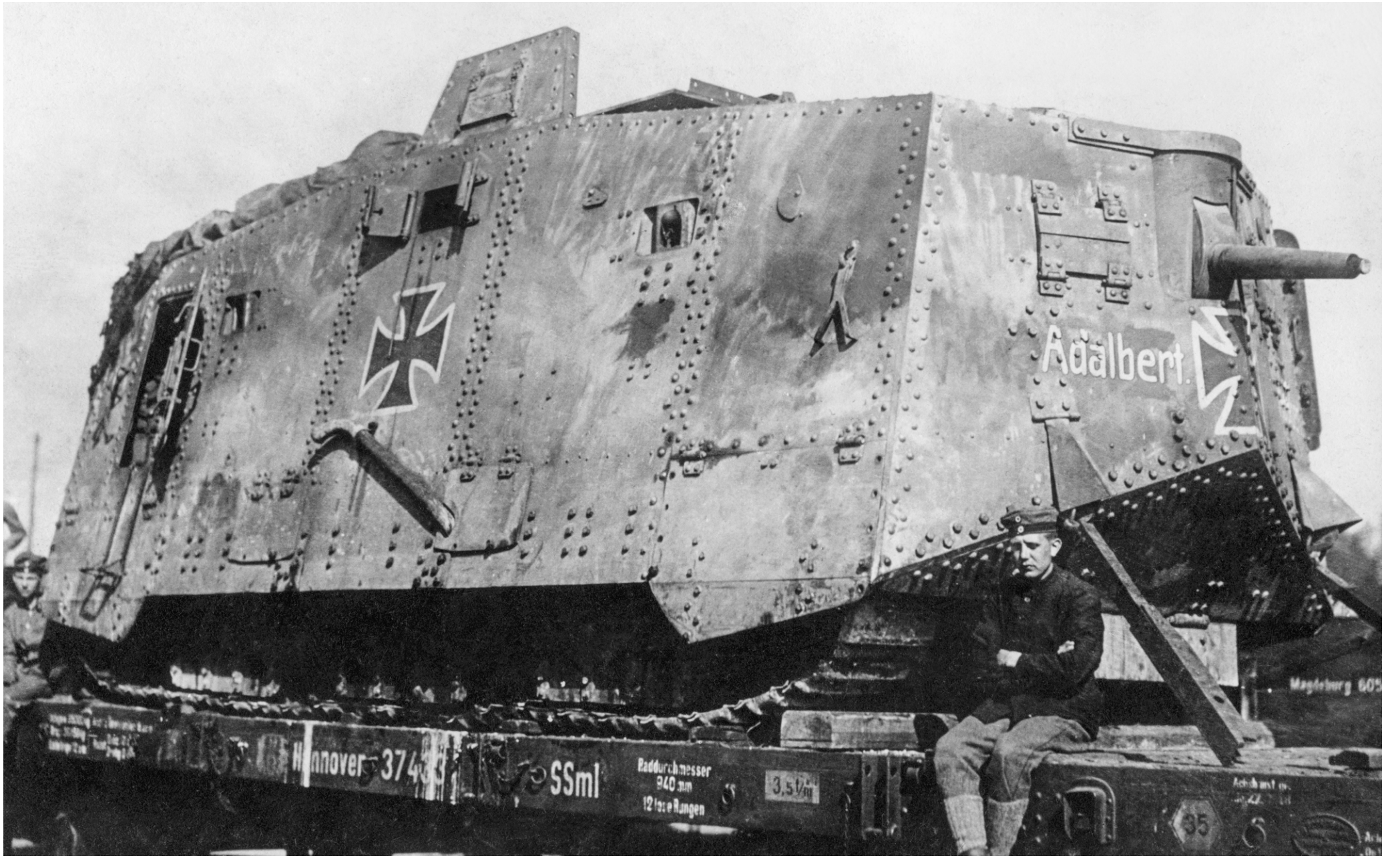
The self-propelled antiaircraft artillery were also applied camouflage paints for these not to be noticed by the enemy aviation. Most transport vehicles and armoured cars were merely painted *Feldgrau* (as these were not operating in the front line).

1918, the Assault Tanks

As far as assault tanks were concerned, the Germans produced reduced quantities. There were mere prototypes of *LK. I, LK. II* and *A7VU;* two *K-Wagen* entered the manufacturing process but had not been ready by the end of WWI. Twenty *Sturmpanzerwagen A7V* assault tanks were in use to form three *Abteilungen* (detachments). At the same time, using British captured tanks model *Mk. IV*, subsequently named *Beutepanzer* (war booty tanks), another six *Abteilungen* were organized too. Some light British *Whippet* seemed useful although only two of them could be repaired and were used for training purposes.

In the previous page. *Sturmpanzerwagen A7V* tank with chassis number 540 mimicking the *Buntfarben Anstrich* pattern. The straight cross or *Balkenkreuz* was introduced in October 1918. There is a longitudinal white band in the roof that intersects with a transversal one in the casemate. The white skull painted onto a black shield was the *Abt. 1.* emblem (The Tank Museum, Bovington)

In this page. A most usual camouflage scheme for artillery guns such as this 7.7-mm *FK 16*. It is made up of three or four colours specks (*Ocker, Braun* and *Grün* or *Schwarz*) applied in a lose way with a paintbrush or a rag onto the *Feldgrau* layer. Really simple indeed, no specialised personnel was required. (Archives Ricardo Recio)


Adalbert.
Hannover 374
SSml
Raddurchmesser
940 mm
12 lose Ringen
3,5 t/m
35

Above these lines. This *Mk. IV Male* was attached to the *Abt. 12*. It has been painted one of the first patterns known as *Buntfarben Anstrich*, with *Feldgrau, Ocker* (dark) and *Rotbraun* blotches divided through black lines. (Archives Ricardo Recio)

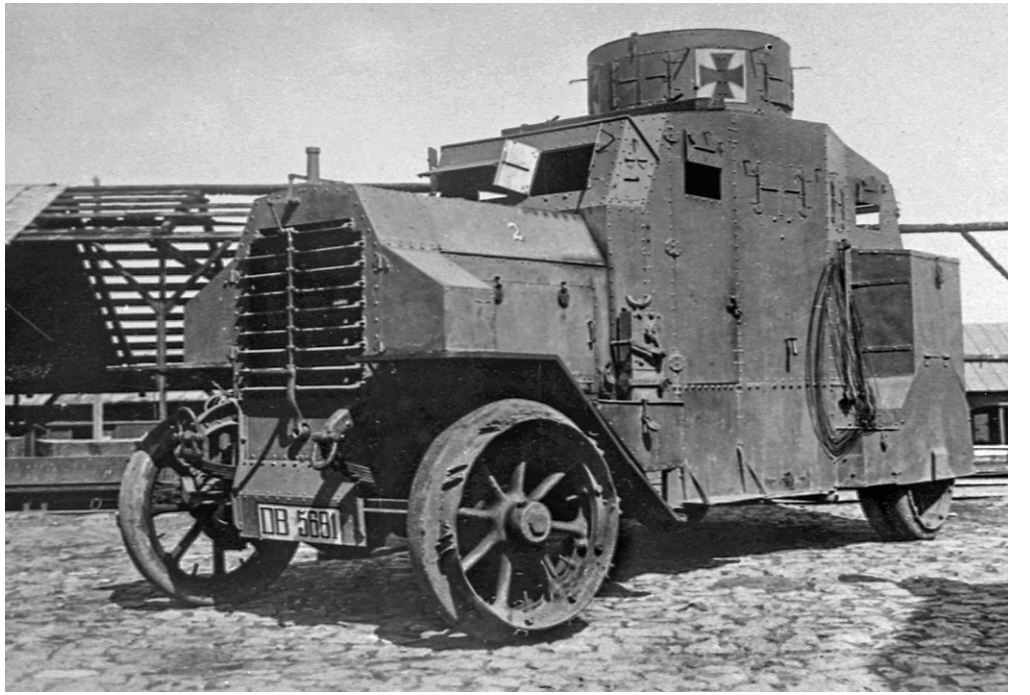
In the previous page. *Sturmpanzerwagen* 543 tank of *Abteilung 3* photographed during a railway transfer in the summer 1918. Each tank was given its own name and this was labelled using white paint. The camouflage blotches were repainted quite often so these appeared superimposed. (Archives Ricardo Recio)

Right, above. The *Geländewagen* were painted *Feldgrau* with no camouflage blotches as these operated in the second line far from the ennemy watchers. In the side, the emblem with the imperial eagle is clearly visible. (Archives Ricardo Recio)

Right, below. In order to avoid misunderstandings, the *Beutepanzer* had crosses (the national emblem) added in four sides and in the roof. There are some patches in the side armour, these were used to cover the hits of the shells. (Archives Ricardo Recio)

By late October 1917, the Daimler factory in Marienfelde, near Berlin, had the first *A7V* ready. This armoured mean painted dark *Feldgrau* (highly greenish hued) was painted big camouflage blotches in the very factory, probably using *Ocker* or *Braun*, the so-called *Lehmgelb* (mud yellow) and *Rotbraun* (reddish brown). The next four tanks were equally painted dark *Feldgrau* and were delivered with the first one to *Abteilung 1* (in short *Abt. 1*) early January 1918. For the whole training period in Northern France, the tanks were added some camouflage smudges (painted no particular pattern). Every available paint at the time was in use. These tanks, had their first combat action, were subsequently sent to workshops and were transferred to *Abt. 3* in April 1918.

After the Battle of Cambrai between 20th November and 7th December 1917, the Germans had captured more than fifty British *Mk. IV* knockout and put out of action. In order to rebuild these in the old industrial premises of the *Societé Anonyme Saint Germain,* located in Monceau-sur-Sambre, a much important railway hub in West Charleroi (Belgium), a big campaign workshop (*Bayerische Armee-Kraftwagenpark 20)* (20 Bavarian Army Automotive Park) was settled. Most of these tanks were in such poor condition that they could be merely used as sources of spare parts. Twenty-eight ones still in good shape were picked out and immediately sent to *B.A.K.P. 20*. As the first ten ones were ready they were delivered to the new *Abt. 11* and *Abt. 12,* from March to April 1918. These tanks were camouflaged with *Feldgrau* (and probably *Rotbraun)* blotches that allowed stripes of the former original British *Khaki* to show.



From March to April 1918 the *B.A.K.P. 20* was also subsequently delivered fifteen new *Sturmpanzerwagen A7V* and this for a further revision and a distribution among detachments. Each *Abteilung* would be given five tanks (this adding up fifteen units) as the remaining five would be eventually used to cover the losses. Among these assault tanks, the five ones in the first batch were painted the same dark greenish *Feldgrau* used in their predecessors while those ten matching the second batch had a lighter greyish finish. The personnel in the *B.A.K.P. 20,* dealing with repair and maintenance were also entrusted camouflage. Before the war, the *Societé Anonyme Saint Germain* was basically devoted to the building of railway wagons. It is feasible that the new occupying forces made good use of all those paints present in warehouses whose shades were similar to the ones used by the Germans. Think of dark green or reddish brown used for the outer painting of the railway wagons, or ivory and amber applied to the inner part of the passengers' coaches. There was no default pattern in use, the shape of the smudges was quite irregular and could significantly vary from coach to coach. By the mid-April some *A7V* were painted mottled schemes with *Rotbraun* and *Lehmgelb* onto *Feldgrau* or

In the previous page. One of the two *Whippet* captured and devoted to drivers' training. The *Feldgrau, Ocker* and *Braun* blotches created a most wonderful scheme. The Iron Cross has been painted in the sides of the casemate. (Archives Maurice Sublet)

In this page. Since the first prototypes of German armoured vehicles appeared in 1906, the Kaiser's Army showed real interest ten years later. In any case, the use was really limited. In the picture, the *Ehrhardt E-V/4*, a 1917 vehicle. It is totally painted *Feldgrau*. (Bundesarchiv / Bild 146-1969-031-53)

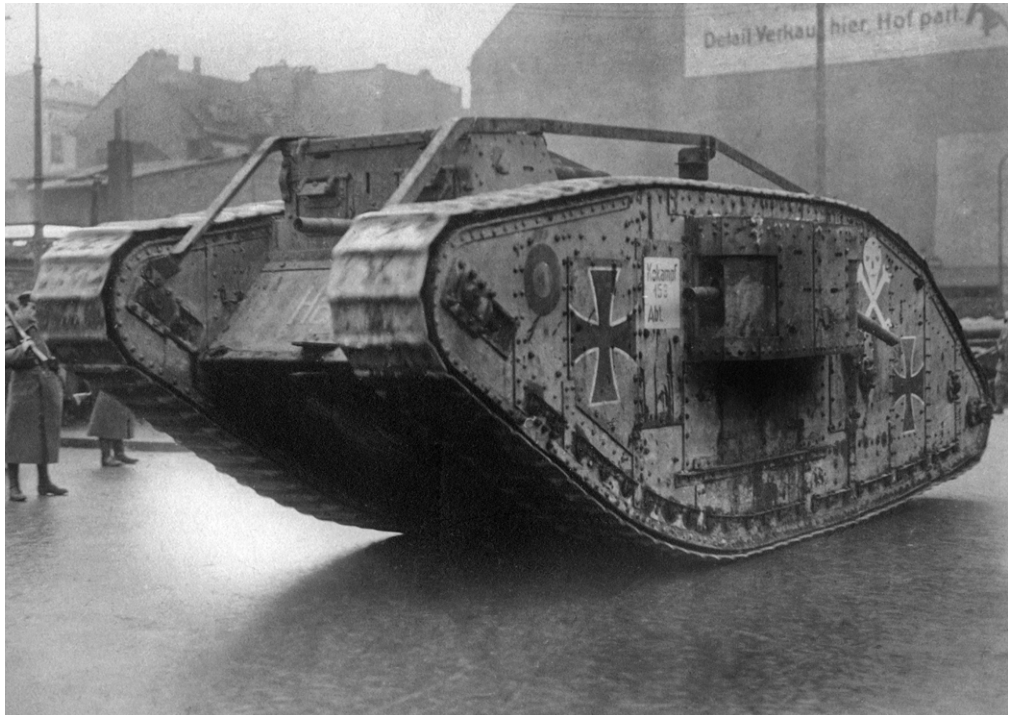
Grün backgrounds. A few ones were painted the aviation *Lozenge* pattern using four or five different colours.

On 24th April, during the attack led by *Abt. 1, 2* and *3* close to *Villers-Bretonneux*, the first combat in history among tanks took place. It was fought between an *A7V* with chassis number 561, attached to *Abt. 2*, and three *Mk. IV,* two of these of the *Female* variant equipped with machine-guns and the other of a *Male* variant equipped with two guns. The meeting ended in a draw, although the German tank had to be blown up as it could not be moved towards the German lines.

On 1st June four detachments with *Mk. IV* tanks had been organised from *Abt. 11* to *Abt. 14*. A number of twenty tanks repainted *Feldgrau* and covered with *Rotbraun* and *Lehmgelb* blotches (French or German *Grün* could have been used too). Some vehicles were added black lines around the peepholes in the side sponsons (in order to hide their position and avoid the shots of the enemy rifles). This reduced the risk of bullets or splinters reaching the inner part.

When in workshops, the tanks were often partially or completely repainted. After every combat they needed a complete mechanical revision and their paint usually showed 'wear and tear' because of bullets and shrapnel. Furthermore, the identification markings got changed from time to time so the old insignia were covered and hidden using camouflage colours while the new ones were painted onto. Usually, coats of diluted paint were smeared (or perhaps there were no high quality thinners) so a few weeks later both the old markings and the outline of the former camouflage blots showed through.

After the combats that took place from the spring to the summer 1918, a huge number of British tanks 'were resting' behind the German lines. It was estimated that about a hundred and seventy could have been repaired. This exceeded the capacity of the facilities in *Monceau-sur-Sambre*, so a few agreements were signed with different German companies for those to undertake this job. At the end of the summer and thanks to these agreements, two new *Beutepanzer* detachments were formed: *Abt. 15* and *Abt. 16.* It seem that the tanks in these units were camouflaged in those premises and the rebuilding was carried out in Germany.



In September 1918, a new camouflage multicolour scheme was introduced called *Buntfarben Anstrich*, which consisted in big *Feldgrau*, *Lehmgelb*, *Rotbraun* and *Grün* bands or stripes (two shades of *Lehmgelb,* French origin, were possibly in use along with *Rotbraun* and *Feldgrau* or *Grün*) outlined with two-finger wide lines painted *Schwarz.* The *A7V* from *Abt. 1* and a few other from *Abt. 2* were repainted following this pattern which was applied to a certain number of *Mk. IV.*

By the mid-October the *B.A.K.P. 20* moved to Wiesbaden, Germany, where eight *A7V,* which had got through the combats, were repaired. The last action undertaken

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In the previous page. *21-cm lange Mörser,* heavy mortar with a specked camouflage scheme recalling the *Lozenge* scheme (made up of polygonal smudges) used in airplanes. This scheme was applied to some assault tanks too. (Archives Ricardo Recio)

In this page. Photographed in Berlin, in March 1919. This is one of the *Beutepanzer* used by the *Kokampf*. More concretely, the number 153 one, named "Hanni" (the name appearing in the glacis), which had been previously in service in *Abteilung 12*. (Archives Ricardo Recio)

by the tanks detachments during the war was a counterattack led by the *Mk. IV* tanks from *Abt. 12, 13* and *14* near Sebourg, on 1st November 1918; the Armistice agreement was signed ten days later.

The Republic of Weimar

From the late 1918 and the early 1919, the Allied started to scrap the armoured German means. In spite of this, a *Sturmpanzerwagen A7V*, two signal tanks built from the chassis of an *A7V* (similar to that one), a *Whippet*, three *Mk. IV Female,* a *Mk. IV Male* and a few wheeled-armoured vehicles fell into the hands of the *Kokampf*. This unit was a part of a paramilitary organisation made up of volunteers named *Freikorps* (Free Corpses) which was formed in Germany just after the end of World War I, to end the Spartacus Revolt or Spartacist uprising (*Spartakusaufstand*) and that operated until 1923. Early January 1919 the *Kampfwagen-Abteilung Körting* (Detachment of *Körting* armoured vehicles) was organised in Lankwitz, Berlin, it was immediately renamed *Kommando der Kampfwagen-Abteilungen* (Command of armoured vehicles detachment), in short *Kokampf.* Among that armoured material, most armoured vehicles were painted *Feldgrau*, the same colour applied to the signal *A7Vs* which had been turned into tanks for controlling riots and street protests. Nevertheless, the *Whippet* and three *Mk. IV* had some wasted irregular blotches painted *Lehmgelb* and *Rotbraun* onto a general layer of *Feldgrau*; while the *Mk. IV Female* and the *Sturmpanzerwagen A7V* were added four-colour *Buntfarben Anstrich* schemes with black outlines. Finally, after signing the Treaty of Versailles on 28th June 1919, these armoured vehicles were scrapped at the request of the Military Inter-allied Commission of Control.

After the Great War, the Imperial Forces got disbanded; in March 1919 the Republic of Weimar (1919-1933) organised some provisional Armed Forces, although the new

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In this page. Front view of a 10.5-cm *IFH 98/09* howitzer. There is some camouflage in the protective shield made up of different colours specks (these specks seem to have been applied with a piece of burlap). (Archives Ricardo Recio)

In the following page. 7.7-cm antiaircraft *Flugabwehrkanone L/27 Krupp* assembled on a platform of a Daimler truck painted *Feldgrau*. Note the imperial eagle (the *Reichsheer* insignia), present in the side of the vehicle. (Archives Ricardo Recio)

Reichswehr (Armed Forces between 1921 and 1935) was officially created on 1st January 1921. This was made up of the *Reichsheer* (Imperial Army) and the tiny *Reichsmarine* (Imperial Navy). The constraints imposed by the Treaty expressly forbade the heavy artillery, the tanks, the aviation, the U-boats and the development of new technologies. In spite of all those restrictions, a hidden program for research and development got started in 1926 which allowed the re-equipment of the *Reichswehr* using modern motorised material. On the other hand, only one hundred thousand men were allowed to be part of these Armed Military Forces so the *Reichsheer* had only seven infantry divisions, each one using fifteen armoured vehicles for personnel transport (and no weapons) along with three cavalry divisions.

The number of motor vehicles was quite reduced, at the beginning these were painted *Feldgrau*, but in 1923, the *Reichswehr* ruled a camouflage scheme named *Buntfarben Anstrich* made up of the following matt colours: *Erdgelb* (yellow sand), *Grün* (green) and *Braun* (brown), quite similar to those ones used during the war and applied with a big flat paintbrush, (thus creating wide bands of twisty outlining). The material which was not painted this scheme showed the usual *Feldgrau* colour.

In the early 1930 decade, there was a great variety of motor vehicles designed for very particular purposes. The first reconnaissance armoured cars were built at that very moment too, exclusively equipped with machine-guns. Some fake tanks were in use for training purposes. These were standing on transport vehicles chassis. The whole material was camouflaged using the aforementioned shades. Regulations dated on 20th April 1933 stated that the blotches must be closed recalling irregularly shaped clouds. On the other hand, the paint could be applied either with a gun

sprayer or a flat paintbrush (if painted with a paintbrush the blotches could be outlined in *Schwarz* using one to three centimetre-wide lines). This outlining was applied either with gun sprayer and paintbrush. This pattern was added to motor vehicles, artillery, searchlights, trailers, pontoons, ammo boxes and tanks, either fake (early) or real (later). The use of *Feldgrau* on motorcycles (including sidecars), command automobiles (up to regiment) and transports for personnel and crews such as buses or vans was stated too. The cars for High Command Officers, High Staff and Head Quarters were also painted *Feldgrau* (including wheels rims) although both the chassis and the mudguards were painted *Schwarz.* These colours were given a numbering code according to Register Number *840 B2* which had been published the previous year (More precisely in June 1932) by *RAL Institut*. From this moment on these were newly named *Feldgrau Nr. 3, Schwarz Nr. 5, Erdgelb Nr. 17, Braun Nr. 18* and *Grün Nr. 28.*

The *Reichsausschuss für Lieferbedingungen* (Reich Committee for specifications of industrial supplies) in short *RAL*, was founded in 1925 as a private company dealing with the control of the paints quality for industrial use, this was an initiative led by the State and the Ministry of Industry. This Committee issued a register or a chart of colours in 1927 named *RAL Farbtonkarte Nr. 840* with forty references, numbered 1 to 40, standardized for Industry, Railways, Armed Forces and so on. Later, as a bunch of additional shades was included a new *RAL Farbtonkarte Nr. 840 B2* was issued in 1932.

In the previous page. In spite of restrictions forced by the Treaty of Versailles, that forbade the German Army the use of tanks, the infantry divisions were allowed to count on armoured vehicles like the one in the photograph. It is a *Sd.Kfz. 3*, a 12-ton vehicle appearing in 1921 which was equipped with a 100-HP engine and two 7.92-mm *MG* machine-guns. (AGA / F-388-22)

In this page. Mercedes-Benz *Stuttgart 260* painted with a gun sprayer using camouflage colours in accordance with the *Reichswehr* regulations since 1923. This model was built from 1929 to 1935. (Archives DBA)

Above these lines. The *Krupp L 3 H 163* truck appearing in close-up was made in the 1936-1938 period. It was a signal vehicle (*Kfz. 72*) with a multicolour camouflage scheme according to the regulations prior to July 1937. (Archives Ricardo Recio)

In the previous page. *7.7 cm FK 16* Campaign gun covered by a net with pieces of cloth, sewn to make a *Splittermuster* (Splinter) camouflage scheme. The use of nets became a common practice during World War I. (Archives Ricardo Recio)

Right, above. After the power was in Hitler's hands, the weapons' development was openly carried out. In 1935, the building of a new heavy armoured vehicle started: we are referring to 8.5-ton *Sd.Kfz. 232 (8 Rad).* (Archives DBA)

Right, below. This 'fake armoured vehicle' *(Panzerwagen attrappen*) has been built using a small reconnaissance off-road car *Maschinengewehrkraftwagen (Kfz. 13*), a vehicle equipped with a *MG 13* machine-gun produced by Adler at the beginning of the 1930 decade. The lettering *'RW'* (*Reichswehr*) was visible in the license plates. (Archives Ricardo Recio)

HITLER, III REICH AND THE WWII

Once the power was in Hitler's hands the expansion of the Armed Forces became true and the military industry developed. In 1937, there was a radical change referred to camouflage colours perhaps intended to emphasize the refreshing and renewing character of the new regime. Some darker hues were adopted (nowadays everyone can relate these dark colours to Blitzkrieg*). Later, as the tide of the battle turned, Germans were found in a defensive position and a new change became necessary. This implied resuming and rethinking all those colours that had been in use during the Great War.*

On 30th January 1933 Adolf Hitler was appointed *Reich Kanzler* and on 16th August 1934, after the death of Hindenburg, he took the position of President of the Republic and named himself *Führer* (leader). The new national socialist regime, would be known as *III Reich*. During the whole period, the secret program focusing on the expansion of the *Reichswehr* came to light so the industry start to work openly at full-speed to improve both the development and the production of weapons; the *Luftwaffe* (Air Force) was created in March 1934. The Armed Forces got re-structured and on 16th March 1935 a law was issued for the *Reichswehr* to get disbarred and the *Wehrmacht* to be constituted. This one was made up of *Heer* (Army), *Kriegsmarine* (War Navy) and the aforementioned *Luftwaffe.* All rules referring to vehicles' painting and to land material remained unchanged and were extensively applied to the *Luftwaffe* the same year. A part of these new weapons, still in production, would be tested in Spain during the Spanish Civil War (1936-1939); there were tests carried out regarding new combat techniques.

In October 1935 the three first *Heer Panzerdivisionen* were organised (armoured divisions), in short *Pz.Div.* This kind of organisation reunited different motorised (mechanized) units in a *Panzerbrigade* (armoured brigade) that, theoretically relied on 561 *Panzerkampfwagen* (tanks), and was divided into two *Panzerregimenter* (armoured regiments) each one with two *Panzerabteilungen* (armoured battalions). The aforementioned motorised units were a *Schützenbrigade* (infantry brigade) with an infantry regiment and a motorcyclist battalion, an artillery regiment, a reconnaissance battalion, a signal battalion, an antitank battalion and a company of engineers along with service, maintenance and supply units.

On 1st December 1936, a few weeks after the second model of tank *(Pz.Kpfw. II)* was put into service, the *Organisationsabteilung des Generalstabes des Heeres* (Depart-

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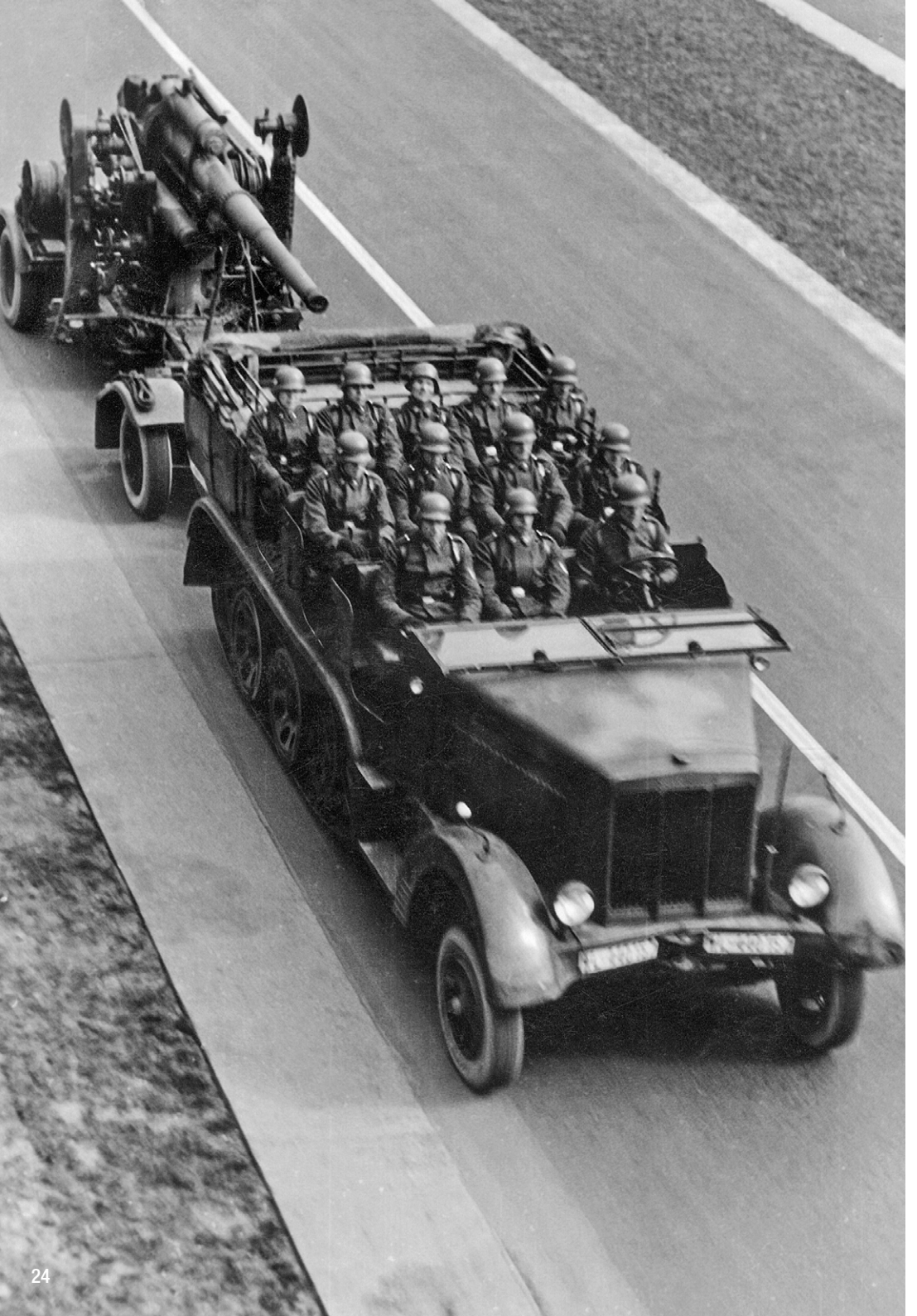
In the previous page. The pattern *Dunkelgrau/Dunkelbraun* went unnoticed once the vehicles were covered by dust and dirt (like for this *schwerer Panzerspähwagen Sd.Kfz. 232 (6 Rad)* which is heading a column of armoured *Sd.Kfz. 13* armoured cars). The pennant in the front left mudguard showed the vehicles during the manoeuvres. (JCISAT / F-0186)

In this page. Front part of the hull of a *Pz.Kpfw. I.* The camouflage is made up of blotches with winding edges painted *Erdgelb Nr. 17, Braun Nr. 18* and *Grün Nr. 28*. The regulations specified that the smudges in every armoured vehicle should be different. In this case the shape of the blotches recalls the profile of a oak leaf. (Archives Ricardo Recio)



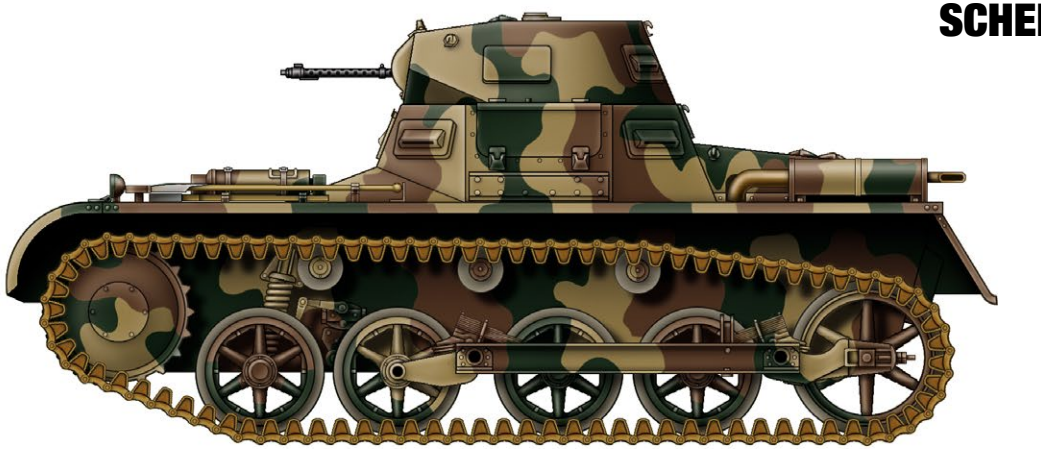
ment for the organisation of the Army High Staff) (organisation reporting to *OKH)* published some charts to show the full organisation of the units and the authorised forces, personnel, crews and equipment. These were the *Kriegsstärkenachweisungen (K.St.N.)* and *Kriegsausrüstungsnachweisungen (K.A.N.).* The following years these charts would be subsequently modified and adapted to new weapons. The guns would be produced according to tactical requirements and to vehicles' development.

On 12th July 1937 the *Oberkommando des Heeres* or *OKH* (Army High Staff), issued some rules regarding some much important changes on the camouflage of armoured vehicles and tanks. This was the *Allgemeine Heeresmitteilungen 1937, Nr. 340* (General Statement of the Army in the year 1937, No. 340), in short *H.M. 37, Nr. 340*, about the use of a new camouflage scheme made up of matt colours *Dunkelgrau Nr. 46* (dark grey) and *Dunkelbraun Nr. 45* (dark brown). The first hue was supposed to be covering the 67% of each vehicle surface while the second one the 33%. The edges of the blotches should be blurred and their shapes were supposed to be irregular (Scheme 2). On the other hand, the small pieces, the bits and the wheels would be painted one colour only (either *Dunkelgrau* or *Dunkelbraun).* It was advised to apply the paint with a gun sprayer to get the surface fully covered; this also helped to avoid unwanted shine as the paint applied with a gun sprayer reflects the light in a much subtler way. The rule was clear, the new scheme would be only applied when the paint in the vehicles had to be renewed. So often, material showing this new pattern along with material painted the old three-colour scheme were seen together in the units. In order to solve this problem, the following year a new instruction was issued dated on 7th November, *H.M. 38, Nr. 687,* and stated that the troops had to repaint, with the new colours, all material still having the *Buntfarben Anstrich* camouflage (Scheme 1), no matter its condition. The order did not mention the *Feldgrau* material so many colour photographs taken during the *Blitzkrieg* pictured motorcycles, automobiles and trucks painted *Feldgrau*.

In this page. *Mittlerer Zugkraftwagen 5t Sd.Kfz. 6/1* towing an antiaircraft *8.8 cm FlaK 18* one. Both the vehicle and the gun had some camouflage made with a gun sprayer using *Grün, Erdgelb* and *Braun* hues in accordance with the regulations issued prior to July 1937. The halftrack license plates showed this belonged to the *Luftwaffe*. (AGA / F-00542-056)

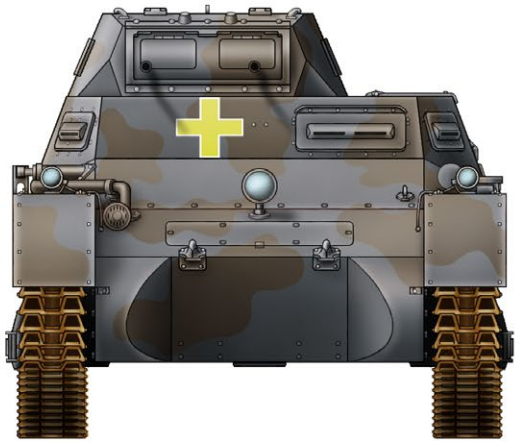
In the following page. Scheme 1. P*z.Kpfw. I Ausf. A (Sd.Kfz. 101*) tank, October 1935/1937. The camouflage was according the regulations dated on 20th April 1933, it was made up of *Erdgelb Nr. 17, Braun Nr. 18* and *Grün Nr. 28* blotches. As the shapes were different in every vehicle, they were all unique. (Illustration made by the author)

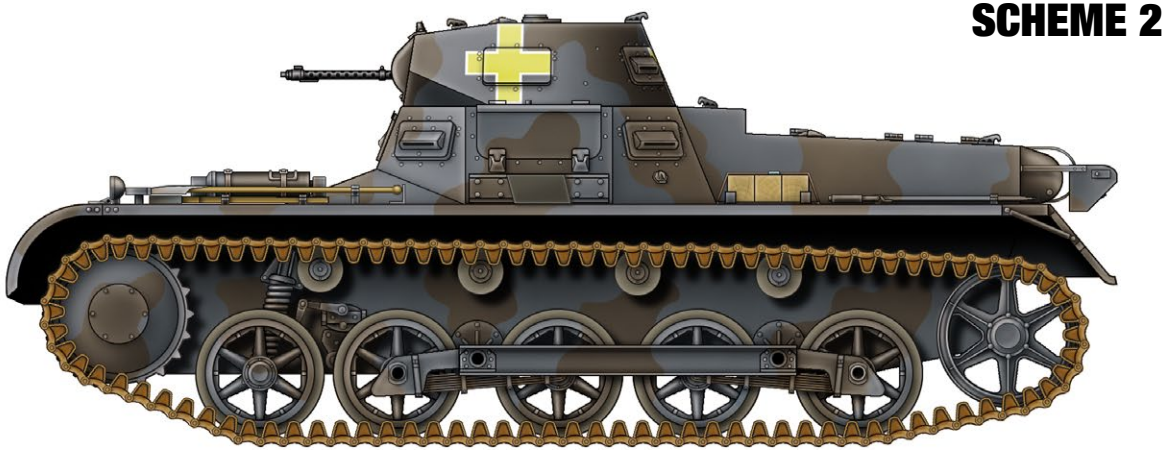
SCHEME 1

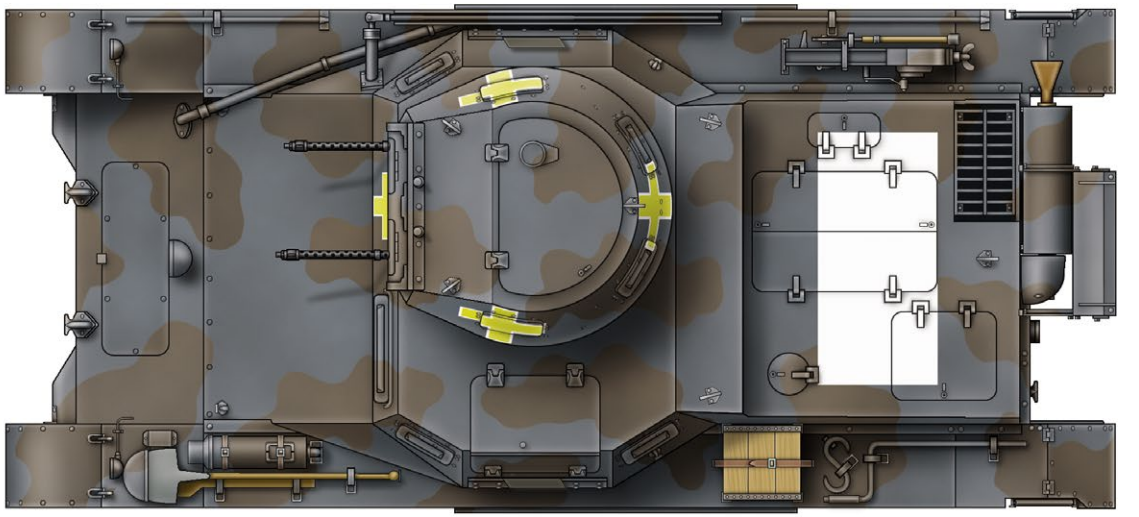


Pz.Kpfw. I Ausf. A (Sd.Kfz. 101), October 1935-1937.

SCHEME 2







***Pz.Kpfw. I Ausf. B (Sd.Kfz. 101)*, 1937-1940.**

Obviously, the armoured material was the first one taking good profit of these rules. The inner parts of these vehicles (both armoured vehicles with closing roof and tanks) had been painted some shining hue named *Elfenbein Nr. 20* (ivory): there were no changes made on this matter.

Also in 1938, but dated on 20th September, the *Luftwaffe* adopted the *Dunkelgrau/ Dunkelbraun* scheme*,* which was put into force in the *Besondere Luftwaffenbestimmungen 1938, Nr. 46* (Special orders of the Air Force in 1938, No. 416), in short *B.L.B. 38, Nr. 416,* following the regulations of the *Heer* Order *Nr. 340*. In this particular case, it was stated that motorcycles (including sidecars) and Command Staff vehicles should be finished only using *Dunkelgrau.* This grey hue was not the same used by *Heer*, it was really a slightly bluish and light one known and registered as *Blaugrau Nr. 4* (blue grey). Sooner, it was ordered that all vehicles painted the old three-colour scheme had to be repainted according to the regulations in vigour.

For the whole 1938, new armoured units were created. Between April and November four *leichte Divisionen* or *le.Div.* (light divisions) were formed; in each one the nucleus was a *Panzerabteilung* or *Pz.Abt.* and just as in *Pz.Abt*. of those existing *Pz.Div*. it had four *Kompanien* o *Kp.* (companies). Two new *Panzerdivisionen* were formed in November too: the *4. Pz.Div.* and the *5. Pz.Div.,* with the same organic structure as the rest but this time the number of tanks was reduced to 320 (the inventory and the stock could significantly change from one regiment to another) and the infantry got reinforced with a larger number of troops. Later, in wartime, a tank destroyer battalion and an anti-aircraft battery were added.

1939-1940, first campaigns

On 1st September 1939 the WWII broke out. All German armoured divisions, including the *10. Pz.Div.* formed in April 1939 and which was still incomplete*,* took active part in the invasion of Poland. More than 2,690 tanks, among those 3,263 in stock (we have made further research on this matter but unfortunately the authors do not agree on the figures), were light tanks, *Pz.Kpfw. I* and *II.* The *1., 2., 3., 4.* and *5. Panzerdivisionen* had still their basic structure although the slow production of tanks forced to reduce the number of companies (three in each battalion) with three or four sections with five tanks each.

Four *Heer's Infanteriedivisionen (mot.)* or divisions of motorised (mechanized) infantry took active part in this campaign, these had been formed in 1937 along with three *SS* units (named *Waffen-SS* in 1940, it was the armed force of the *SS*).

In the previous page. Scheme 2. *Pz.Kpfw. I Ausf. B (Sd.Kfz. 101)* tank, 1937/1940. Camouflage scheme in accordance with the rule *H.M. 37, Nr. 340*, made up of *Dunkelgrau Nr. 46* and *Dunkelbraun Nr. 45*. The white rectangle and the crosses were painted for the first time on 13th July 1939. The crosses of some tanks were repainted yellow during the Polish campaign. (Illustration made by the author)

In this page. *Pz.Kpfw. II Ausf. C* tank painted *Dunkelgrau* and camouflaged with *Dunkelbraun* using a gun sprayer. The edges of the blotches were done at first, next the smudges got filled, sometimes the perimeter was perfectly defined but the inside wasn't covered in a homogeneous way. (Archives Antonio Gonzalez)

These were infantry regiments completely mechanized with the same equipment as *Heer* whose vehicles and anti-tank guns were painted according to the regulations in vigour. The *Waffen-SS* would expand so greatly that soon it would rely on several divisions. In the Western Front these forces would always be under the *Oberkommando der Wehrmacht* (Armed Forces High Staff) or *OKW* operative control, but in the Eastern Front, under *Oberkommando des Heeres* (Army High Staff) or *OKH.*

Between October 1939 and January 1940 the four *leichte Divisionen* were reinforced and transformed into *6., 7., 8.* and *9. Pz.Div.* The three first ones had a *Pz.Rgt.* and a *Pz.Abt.* (that means three *Pz.Abt.* in each division), while the last one had a *Pz.Rgt.* (two *Pz.Abt.)* Like the *Infanteriedivisionen* (infantry divisions), these units started to be slowly equipped with the first self-propelled artillery guns built, named *Panzerjäger* (tank destroyers). Then the *Wehrmacht* had ten *Panzerdivisionen* with 2,582 tanks (from a total number of 3,505) which took active part in the Western Campaign on 10th May 1940.

So many authors state that during these operations and previously in Poland most German armoured fighting vehicles (AFV) were solely painted *Dunkelgrau.* It seems evident that this hue along with *Dunkelbraun* were really dark so in all black and white photographs it is so complicated to perceive the outline of the camouflage blots especially if the paint has been applied with a gun sprayer and more particularly in all vehicles covered in dust. In any case, we have found evidence (in both campaigns) of material painted two camouflage colours or exclusively painted *Dunkelgrau* (Scheme 3).

On 12th June 1940, the units were categorically banned to buy the paint to suppliers, the paints had to be delivered exclusively through official distribution channels; the units would only be delivered *Dunkelgrau*. This guideline was included in the regula-

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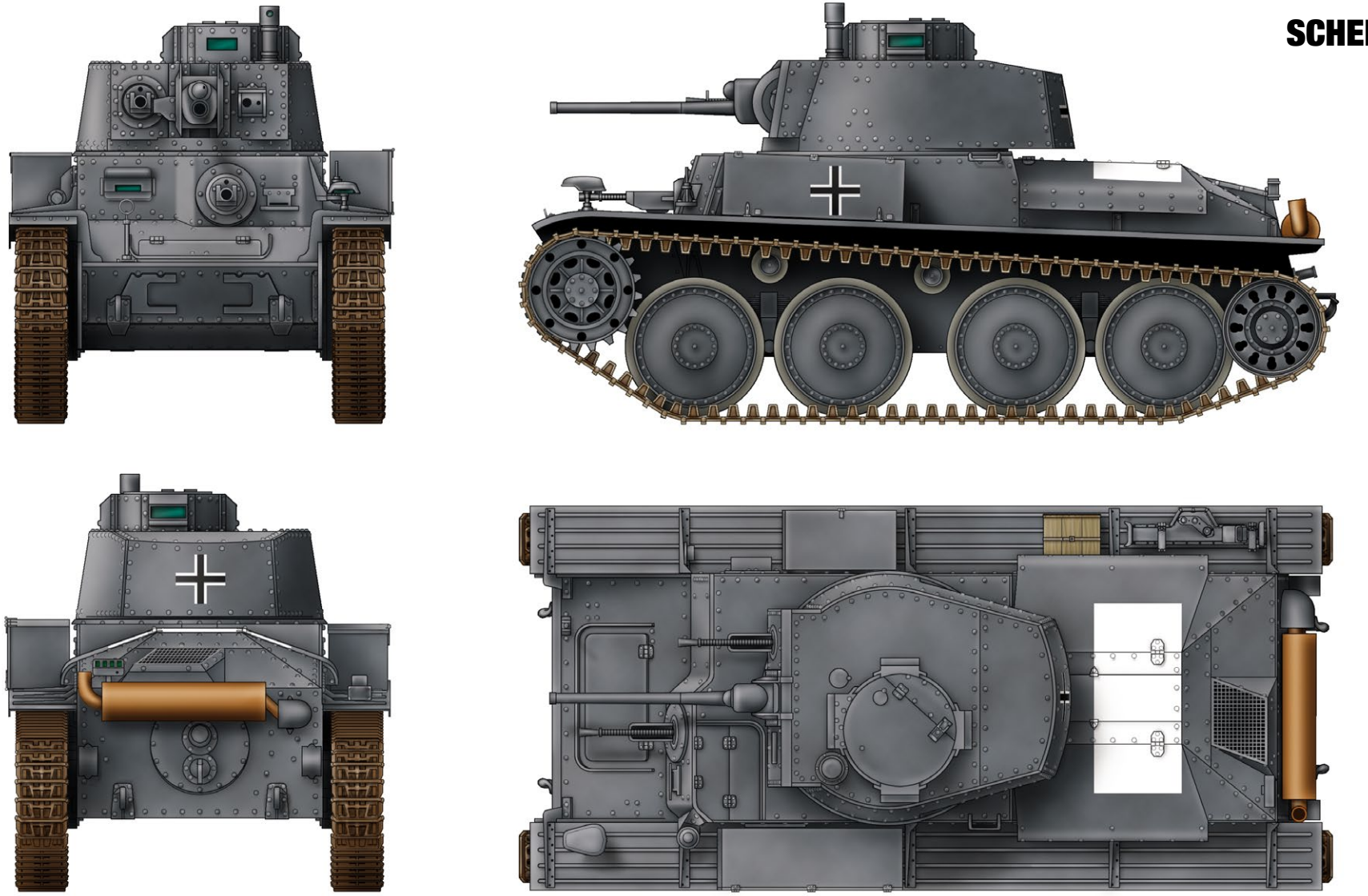
In this page. *Kl.Pz.Bef.Wg. (Sd.Kfz. 265*) Command tank built on the chassis of an older *Panzer I.* The camouflage scheme is made up of *Dunkelgrau Nr. 46* and *Dunkelbraun Nr. 45*. Some vehicles were delivered to units with no assembly for the machine-gun (mainly due to production delays). (Archives Antonio González)

In the following page. Scheme 3. *Pz.Kpfw.38(t) Ausf. C* tank, 1940/1943. Monochrome pattern in accordance with the rule *H.M. 40, Nr. 864*. It was exclusively made up of *Dunkelgrau Nr. 46*, which would be named *Dunkelgrau RAL 7021* from 10th February 1941. (Illustration made by the author)

SCHEME 3



Pz.Kpfw. 38(t) Ausf. C, 1940-1943.

Panzerregiment, March 1939

Stab Panzerregiments

Nachrichtenzug (mot.)

leichte Panzerzug

I. Abteilung

Stab Panzerabteilung

Nachrichtenzug (mot.)

Staffel einer Panzerabteilung (replacement)

1. leichte Panzerkompanie

Kompanie Trupp

1. Zug

2. Zug

3. Zug

4. Zug

2. leichte Panzerkompanie

Kompanie Trupp

1.Zug

2. Zug

3. Zug

4. Zug

3. leichte Panzerkompanie

Kompanie Trupp

1. Zug

2. Zug

3. Zug

4. Zug

4. leichte Panzerkompanie a

Kompanie Trupp

1. Zug

2. Zug

*To identify the vehicles, go to page 126

II. Abteilung

Stab Panzerabteilung

Nachrichtenzug (mot.)

Staffel einer Panzerabteilung (replacement)

5. leichte Panzerkompanie

Kompanie Trupp

1. Zug

2. Zug

3. Zug

4. Zug

6. leichte Panzerkompanie

Kompanie Trupp

1.Zug

2. Zug

3. Zug

4. Zug

7. leichte Panzerkompanie

Kompanie Trupp

1. Zug

2. Zug

3. Zug

4. Zug

8. leichte Panzerkompanie a

Kompanie Trupp

1. Zug

2. Zug

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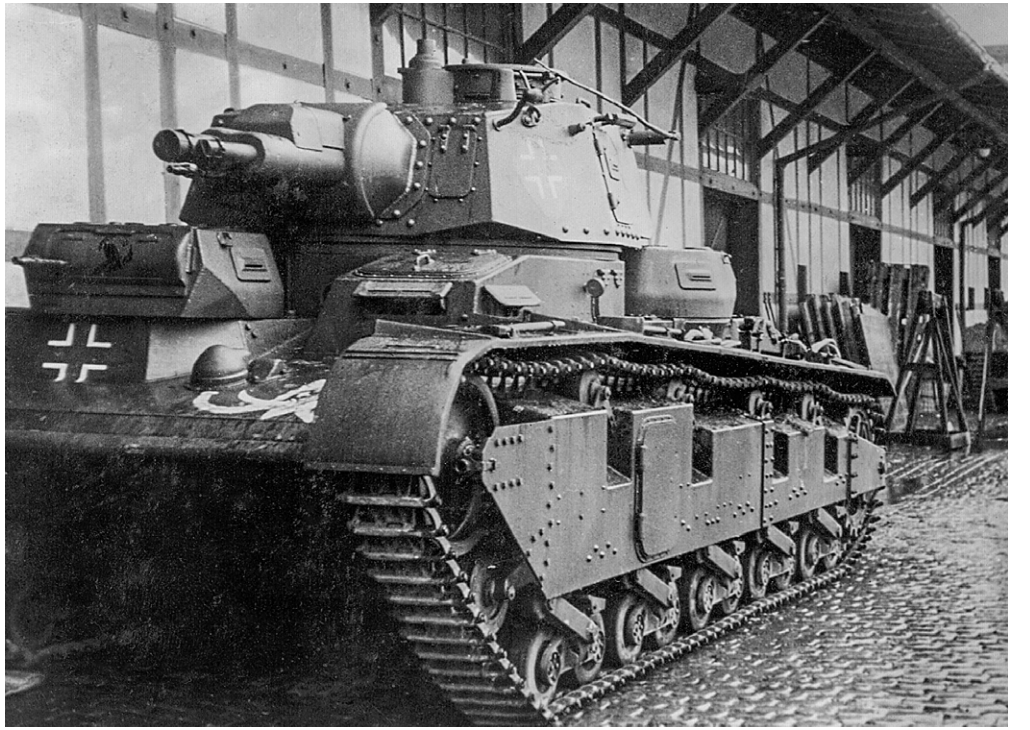
tion *H.M. 40, Nr. 864* dated on 31st July which intended to save paint and stipulated the *Dunkelgrau Nr. 46* shade as the only one to be applied to all *Wehrmacht's* vehicles and equipment (at that very moment there was a huge amount of vehicles mainly due to captured material). This colour had shown to be quite effective when hiding vehicles in urban areas, under the building shadows or in forests under the wooded parts. Nevertheless, when in open field, it was not really the best choice so any better option had to be found in a near future. Anyway, the colour photographs put into evidence the old *Dunkelgrau/Dunkelbraun* pattern well into the latter part of 1942.

Once the operations in France were done, Hitler ordered the creation of ten new *Panzerdivisionen;* it was necessary to halve the number of tanks of those existing at the time so the surplus could be re-assigned. Acting that way, and considering a few *Infanteriedivisionen*, most of these motorised (mechanized) or *Inf.Div. (mot.)*, ten *Panzerdivisionen* (from *11. Pz.Div*. to *20. Pz.Div*.) were organised from August to November 1940. Then the nucleus was a *Panzerregiment* with two *Panzerabteilungen*, (except the *18. Pz.Div.*, which relied on a *Panzerbrigade* with two *Pz.Rgt.* until May 1941).

The number of colours included in the *RAL Nr. 840 B2* chart had progressively increased and reached 100 hues; as it became much necessary to rationalize it, at the request of the *Wehrmacht*, this register was fully revised between 1939 and 1940. It was given a new code *RAL Nr. 840 R*. Now the hues were all matt and were classified in nine main groups numbered 1 to 9 (with a 0) so 10 matched the yellow group, 20 the orange lot, 30 the reds, 40 the violets and so on. Besides, every colour in a group was given a two-figure number to mark its position into that group (for instance, the tenth colour in the brown range matched the reference *RAL 8010)*.



According with this revision, the references were the following ones:

Feldgrau Nr. 3: RAL 6006	*Braun Nr. 18: RAL 8010*
Blaugrau Nr. 4: RAL 7016	*Elfenbein Nr. 20: RAL 1001*
Schwarz Nr. 5: RAL 9005	*Grün Nr. 28: RAL 6007*
Erdgelb Nr. 17: RAL 8002	*Dunkelbraun Nr. 45: RAL 7017*
	Dunkelgrau Nr. 46: RAL 7021

Later and in order to avoid any unwanted mistake when transcribing data, the name of the colour got added in an unofficial way in front of the reference, since 10th February 1941 the colours were named as in the chart in page 37.

In the previous page. The eye-catching crosses attracted the fire of antitank guns, that's why so many crews like the one of this *Pz.Kpfw. III Ausf. D*, were forced to improvise on the go and to hide them. Just thirty tanks were built that matched this model. (AGA / F-00528-24)

In this page. After the Polish campaign it was decided adopting a low-visibility cross (with a hollow centre) like the ones in this *Neubaufahrzeug Ausf. B* photographed in Norway in April 1940. The emblem of the *Panzerabteilung zur besonderen Verwendung 40* (armoured battalion for special operations No. 40) is clearly visible in the glacis of the vehicle in close-up. (JCISAT / F-0139)

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Above these lines. The march down dusty paths created a patina that covered the vehicles and allowed a sort of natural camouflage. The crew of this *Pz.Kpfw. III Ausf. F* had removed part of the dust in the turret for the emblem (a lion) to be visible. This was a unique emblem belonging exclusively to the battalion. (AGA / F-00517-009)

In the previous page. *Dunkelgrau* paint showed to be quite efficient to camouflage the material in the shadows, in forest areas or in building parts. There is an antitank *PaK 36* piece in close-up and a *Pz.Kpfw. IV Ausf. A* in the background, both painted *Dunkelgrau*. Just thirty-five *Panzer IV* tanks, matching this variant, were built. (AGA / F-00517-09)

Right, above. During the campaign in the Balkans, the colours in accordance with the regulations prior to 1937 were in use again. These were applied to paint camouflage blotches to some vehicles. Note the *Erdgelb* and *Grün* blotches (probably) onto the standard *Dunkelgrau* in these *Sd.Kfz. 253* and *Sd.Kfz. 251* halftracks. (Archives JCISAT)

Right, below. The darker shade of *Dunkelgrau* and *Dunkelbraun* avoided any contrast. In fact, when the camouflage blotches had been gun sprayed their borders were blurred enough. The smudges are clearly visible in the hood of the *Horch Kfz. 15* automobile. (waralbum.ru)

These were the names frequently used (but note that they were unofficial names so a same colour was named in different ways). As one can notice *RAL 8010* had been removed.

Elfenbein RAL 1001	*Dunkelbraun RAL 7017*
Feldgrau RAL 6006	*Dunkelgrau RAL 7021*
Grün RAL 6007	*Erdgelb RAL 8002*
Blaugrau RAL 7016	*Schwarz RAL 9005*

Afrikakorps

As the British forces breathtakingly progressed in the North of Africa and the Italian forces were in very poor conditions, Hitler made up his mind and quickly sent German forces to balance the situation. This expeditionary force was called *DAK* or *Deutsches Afrikakorps* (German Africa Corps); it was put under Erwin Rommel's command and became legendary.

The first German units landed in Tripoli's harbour by the mid-February 1941. The forces of *5. le.Div.*, were among these troops. This was an armoured unit that had a 120-tank *Pz.Rgt*. which had been formed quite in haste using elements from the *3. Pz.Div*.

Due to the lack of time, both the material and the vehicles of this expeditionary force were painted *Dunkelgrau RAL 7021* (pretty inadequate in those lands). The crews were able to solve the problem by smearing mud onto their vehicles (mixing sand and water or applying a coat of oil for the sand to stick through sprinkling). This was a temporary solution as the *Dunkelgrau* tended to show underneath. Probably some of the vehicles were repainted using Italian paints such as *Grigio verde* (grey green) or *Giallo sabbia* (yellow sand) from the *Regio Esercito* (Royal Army).

On 17th March the *OKH* issued the regulation *H.M. 41, Nr. 281,* that ruled the use of two camouflage colours for the North-African operations theatre: *Gelbbraun RAL 8000* (yellow brown) and *Graugrün RAL 7008* (literally grey green but in fact greyish khaki). These shades are thought to cover respectively 2/3 (67%) and 1/3 (33%) of the vehicle surface reminding the old *Dunkelgrau*/*Dunkelbraun* scheme with its blurred edges. At the same time, the small pieces and the wheels should be painted one colour only, either *Dunkelgrau* or *Dunkelbraun.* The German civil industry had

In the previous page. *Pz.Kpfw. III Ausf. G, Pz.Rgt. 5, 21. Pz.Div.*: a photograph taken in Cyrenaica (Libya) in 1941. During the western campaign the tactical numbers had been labelled in big size so, when in combat, the Commanders could identify the tanks in their own units. (JCISAT-0138)

In this page. Western Campaign, 1940. *Pz.Kpfw. 38(t), 7. Panzer-Division*. There is a white rectangle for air identification in the engine deck. Some bright yellow canvases were used in the same period as the aviators weren't able to see the white markings covered in dust. (waralbum.ru)

been using these hues during a certain period of time for different purposes (just as it had used all other camouflage colours applied to military vehicles in wartime). While *RAL 8000* was employed for painting the metropolitan electrical trains in Berlin, *RAL 7008* was used in railway network metallic structures. Both of them were too dark to suit the desert camouflages so a year later some more appropriate hues would be picked (Scheme 4).

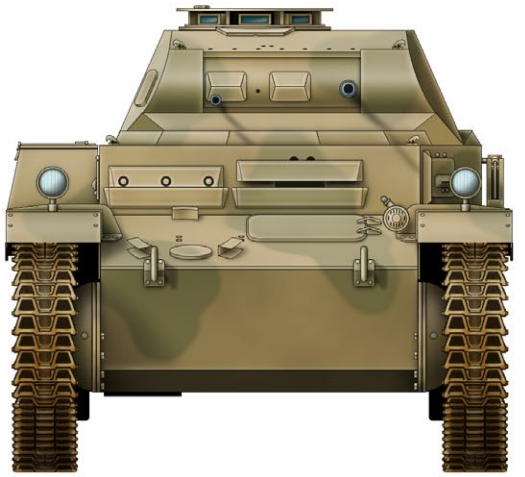
The regulations related to camouflage used to be applied immediately in the factories, just after the issuing, although from time to time the old colours were applied until stocks were exhausted. In the battlefront the situation was really different: as complying with all the regulations depended on the supplies, the war operations, the enemy moves or the exhausted troopers, the fulfilment could take a few weeks. This happened constantly in wartime. Furthermore, the combat units did not apply the regulations by the book so when there was enough paint most *Afrikakorps'* armoured vehicles were repainted exclusively *RAL 8000*. This could be done in a less homogeneous way so the task took very little time (due to rush and circumstances). In case there was a lack of paint sometimes the Germans also made good use of all those paints taken from their enemies: the vehicles coming from a war booty had their own original colours but were added grand crosses in order to avoid any misunderstanding.

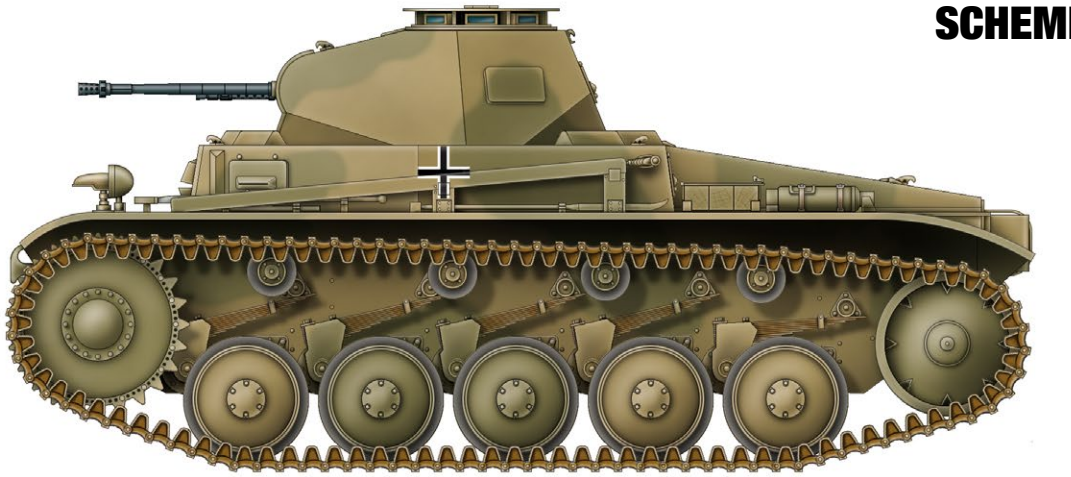
By the spring 1941, the *DAK* was reinforced with the *15. Pz.Div.*; while in August, the *5. Ie.Div*. was promoted to armoured division and renamed *21. Pz.Div.* At the same time, a light unit was formed and one year later this would be equipped with a *Pz.Abt*. and renamed *90. Afrika Div.*

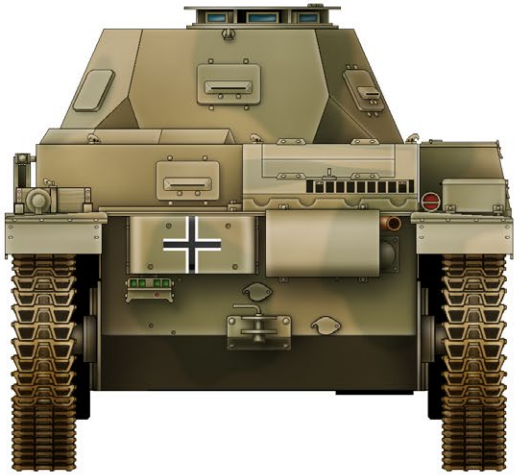
In this page. Command halftrack vehicle *Sd.Kfz. 253* of *Art.Rgt. (mot.) 155* (155 motorised artillery regiment), *21. Panzerdivision*. The camouflage scheme is made up of *Gelbbraun RAL 8000* and *Graugrün RAL 7008*. The poor contrast between the shades was even more evident when the paint got bleached under the sun and got covered by dust and dirt. (Signal)

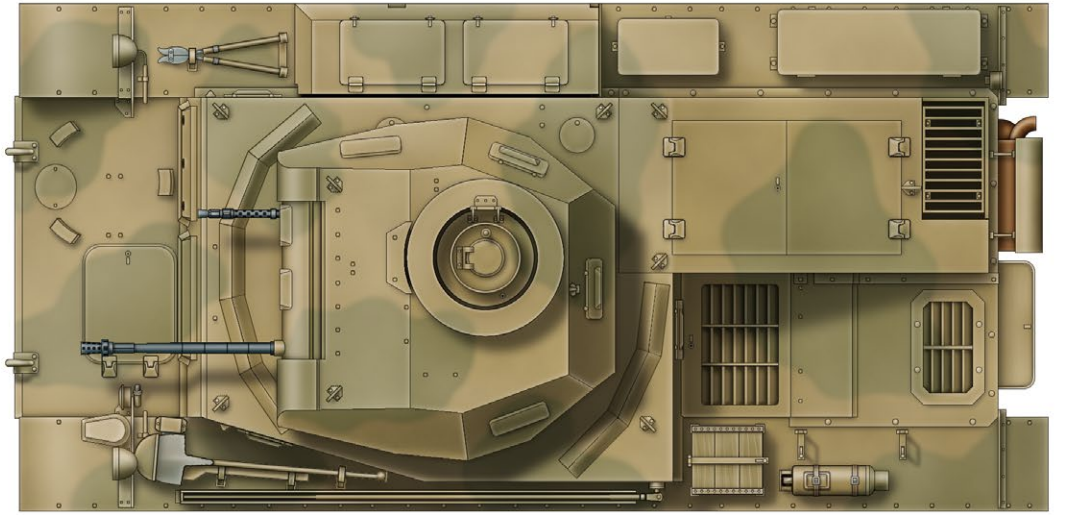
In the following page. Scheme 4. *Pz.Kpfw.II Ausf F (Sd.Kfz. 121)*, 1941-42. Camouflage pattern for the North of Africa in accordance with the rule *H.M. 41, Nr. 281*. Similar to the European one (as far as shapes are concerned but with different shades), this scheme is made up of big clouds painted *Gelbbraun RAL 8000* and *Graugrün RAL 7008*. (Illustration made by the author)

SCHEME 4









Pz.Kpfw. II Ausf. F (Sd.Kfz. 121), 1941-1942.

On these lines. Command tank *Pz.Bef.Wg. III Ausf. E (Sd.Kfz. 267)*, *Stabskompanie*, *I Abteilung/Pz.Rgt. 5*, *21. Pz.Div.* The lettering and numbering "I01" have been partially covered by the camouflage paint *Braun RAL 8020*. This kind of tank is equipped with different radio stations. The turret was fixed, the gun was a fake. After losing the simulated gun in a skirmish, the crew had made good use of a wood stick to replace it. (waralbum.ru)

Right, above. The extreme conditions of the weather in the desert with sandstorms and temperatures changing drastically affected the paint. This 75-mm *PaK 40* antitank gun shows remainders of a worn and bleached coat of *Gelbbraun RAL 8000* onto right-from-the-factory *Dunkelgrau RAL 7021*. (waralbum.ru)

Right, below. *Pz.Kpfw. III Ausf. G* attached to the Staff Company of a *Panzerregiment*, as shown by the tactical numbers "1R" visible in the storage bin (*Rommelkiste*) in the turret rear. It is a *Pz.Rgt. 8, 15. Pz.Div.* In the lower half of the hull the coat of *Braun RAL 8020* had nearly vanished because of the abrasive effect of the sand. The white cross in the 20-liter *Kraftstoff* showed it contained water. (waralbum.ru)

In the following page. *Pz.Kpfw. IV Ausf. F2* camouflaged according to the 1942 regulations, with gun sprayed *Grau RAL 7027* blotches onto the general coat of *Braun RAL 8020*. In B/W photographs these light colours cannot be clearly identified. (Archives Ricardo Recio)

843

1941, Barbarossa

Acting against the regulations was a common practice in Europe and become a constant for the whole conflict. During the campaign in the Balkans and Greece, in April 1941, most vehicles were painted *Dunkelgrau,* although there were also armoured means with camouflage blotches of *Braun RAL 8010*, *Feldgrau RAL 6006* or some of the colours used before the Order *H.M. 38, Nr. 687* was in vigour. The three first *Sturmgeschützabteilungen* (assault gun battalions) took active part in these operations each one with three batteries of six *StuG. III*. These units showed to be so really efficient that from that moment on, the number got constantly increased.

On 22nd June 1941, the Operation *Barbarossa* (aka the attack against the USSR) was launched. The Germans deployed seventeen *Panzerdivisionen* in the spearhead. 3,377 tanks took active part in the Offensive (from a total number of 5,262 in the *Panzerwaffe's* inventory). More than 50% were light tanks (there were two times more *Pz.Kpfw. I* and *II* than *Pz.Kpfw. 38(t)* and *35(t)*, or even more). The ninth part were *Pz.Kpfw. IV* tanks and the rest were *Pz.Kpfw. III*. Most AFVs along with soft-skinned vehicles were painted *Dunkelgrau,* but as in the Balkans, a part of the material was not camouflaged by the book. These vehicles had been painted some colours which were not included in the regulations in vigour. The *OKH* had been quite optimistic, and had foreseen a victory against the USSR after a short conflict that would had lasted just a few weeks. It was supposed to be finished before the winter so no winter warm clothing had been foreseen for the crews, no special oil for the guns, and no antifreeze for the engines… and obviously no winter paint. The first snows fell in October, but until 18th November there was no instructions from the *OKH.* In that very date the *OKH* issued a regulation *H.M. 41, Nr. 1128*, to rule all units sent to Norway, Finland and Russia about the use of water-soluble paint *Weiss*

In this page. A group of *Panzer III* tanks, *Pz.Rgt. 15, 11. Pz.Div.* was approaching a Russian village in their way to Moscow. The unofficial emblem of the division, a motorised ghost waving a sword can be seen in the rear part of the first tank. The *Balkenkreuz* is a hollow one merely outlined with white paint. (Signal)

In the following page. From the moment the first snow fell in the Eastern front, in the autumn 1941, the Germans were forced to improvise a camouflage on the go (white paint was not available). The dark shade of this *Pz.Kpfw. IV Ausf. F* was turned into a lighter hue using bits of white chalk. (waralbum.ru)

Panzerregiment, November 1941

Stab und Stabskompanie eines Panzerregiments

Nachrichtenzug

leichte Panzerzug

I. Abteilung

Stabskompanie einer Panzerabteilung

Nachrichtenzug

leichte Panzerzug

Staffel einer Panzerabteilung (replacement)

Pionierzug

1. leichte Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

2. leichte Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

3. leichte Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

4. mittlere Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

*To identify the vehicles, go to page 126

II. Abteilung

Stabskompanie einer Panzerabteilung

Nachrichtenzug

leichte Panzerzug

Staffel einer Panzerabteilung (replacement)

Pionierzug

5. leichte Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

6. leichte Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

7. leichte Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

8. mittlere Panzerkompanie

Kompanie Trupp

1e. Zug

2. Zug

3. Zug

4. Zug

RAL 9001 (white) excellent to camouflage the vehicles in all snowy environments. The white paint had to be removed once the snow had melted. The delivery of paint supply took a few weeks more or there were no deliveries at all so it was necessary improvising. In order to camouflage the vehicles, lime (once diluted in water or chalk), snow blocks or even white fabric canvases were used.

Meantime, between September and November 1941, three new armoured divisions had been formed *22. Pz.Div., 23. Pz.Div.* and *24. Pz.Div.*, which were sent to the Eastern Front in 1942.

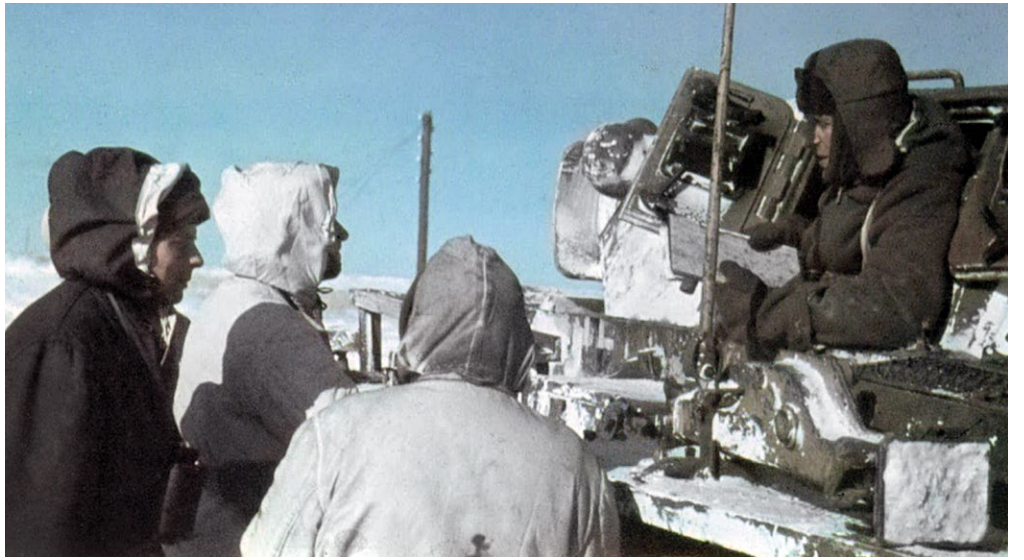
1942, re-organisation

By the spring 1942, the winter camouflage was removed; the *RAL 9001* could be easily removed with a big brush and soda or petrol as this did not damage the *Dunkelgrau* hue underneath. During this period, as the woods and the fields were turning to green, it became necessary finding a different camouflage colour. Some mimicking blotches had to be painted onto *Dunkelgrau* so the old paints were in use again, especially *Grün RAL 6007* (there was enough stock of this shade so it was in use for the whole war). A much efficient trick was placing branches, foliage or hay onto the vehicles' surface so their silhouette got broken; so many times mud was also employed to give them the shade of the ground so they could remain unnoticed.

On the other hand and although there were no regulations referred to this matter, a large number of colour photographs taken in Russia and in the North of Africa in the 1941-42 period, show tanks, assault guns, self-propelled artillery and soft-skinned vehicles painted greyish light hues. In 1941, and named *Technischen Lieferbedingungen* (technical specifications), in short *TL*, the *OKH* had issued a large series of regulations that focus on so many matters related to paint. Both the kind of primer and the right type of paint according to chemical composition, characteristics, corrosion, and fuel or fire resistance were stated. These (primer and paint) were meant to cover all possible materials (wood, aluminium, steel…) or equipment (ammunition, guns, vehicles…). The weather conditions and the geographic areas had also been taken into consideration. The list of colours in the *TL 6303 B* included some grey hues, such as *Marinegrau RAL 7002* (Navy grey), *Grau RAL 7003* (grey) or *Hellgrau RAL 7009* (light grey), that were used in the production of some mechanical components. We wonder if Tomáš Chorý's statement included in his book '*Camouflage Colors. Wehrmacht Heer, 1939-1945*' about some of these hues used during the manufacturing process to paint the outer surface of the armoured vehicles, is true.

On 25th March 1942, a new regulation, *H.M. 42, Nr. 315,* referring to camouflage of all vehicles on duty in the North of Africa was issued. This rule focussed on the use of two new colours, *Braun RAL 8020* (light brown) and *Grau RAL 7027* (literally means grey but it was a grey beige). As in the former instruction, the shades were to be distributed through irregular blotches with blurred edges (according to the usual 2/3 and 1/3 proportion) respectively and on the vehicle surface. The small pieces and the wheels had to be painted one colour only. The units were supposed to ask for the paints supply once the stocks were exhausted. The new shades were lighter so

In this page. Heavy Command armoured vehicle *Sd.Kfz. 247 Ausf. B* attached to the *3. Pz.Div.* During the Eastern campaign it became evident that *Dunkelgrau* paint was totally inadequate to mimic the vehicles in the immense steppe. (waralbum.ru)



On these lines. The shortage of tools forced the crews to sharpen their wits for distributing the white paint onto the armour. The men of this *Pz.Kpfw. IV Ausf. E* are applying the paint with some hay bushes. (waralbum.ru)

Left, above. In all tanks like this *Panzer III* and in armoured vehicles with a closed roof, the inside of the hatches was painted the same colour as the outer part, so if open these would not stand out. (waralbum.ru)

Left, below. After the winter, the coat of white paint had to be removed. Note, in the picture, the crew of a *Sd.Kfz. 251/1 Ausf. C* halftrack cleaning the white coat with a water bucket, a brush, a piece of cloth and hay bushes tied with some wire. (waralbum.ru)

they seemed quite appropriate for the desert. Quite soon, the *Afrikakorps* started to receive the material from the factories already painted the *Braun/Grau* scheme or simply painted *Braun RAL 8020* (Scheme 5).

After the winter 1941-42 in the Eastern Front, both the *Panzerdivisionen* and the *Infanteriedivisionen (mot.)* had lost a grand amount of material. This had to be replaced: a much difficult task in such a short notice. A new unit was formed in February 1942, the *25. Pz.Div.* that was intended to take active part in *Fall Blau* Operation (this offensive would be taking place early in the summer in the Southern sector of the Eastern Front). The *Pz.Rgt.* were all reinforced through a third *Pz.Abt.* while some *Inf.Div. (mot.)* were given a *Pz.Abt.*; these decisions implied that, in some relatively quiet sectors such as North and Centre sectors, the number of *Pz.Abt.* had to be reduced to one in each *Pz.Rgt.* On 1st July 1942, the number of tanks in the whole Eastern Front added up to 2,535. The expectations could be met as Speer was appointed Minister of the Reich for armament and war production and Guderian was promoted as *Panzertruppen* Inspector (armoured troops): this involving a continuous increase and a rationalisation of the production. The expectations were also met at the expense of *DAK* since a great quantity of material, that was intended to go to the North of Africa, was sent to Russia. These tanks left the factories with their new 'tropical' camouflage and this pattern showed to be effective in the barren landscape of the Caucasus; sometimes the crews added camouflage blotches using different colours, usually *Grün RAL 6007*. On 3rd July 1942, the *OKH* issued a new instruction, *H.M. 42, Nr. 600* that ordered to use, in Crete, the same compulsory camouflage scheme in force in the North of Africa.

In the spring the first *Heer's schwerer Panzerabteilungen* (heavy tanks' battalions) or *schw. Pz.Abt*. were being organised, these were some independent units with an elitist character which were equipped a few months later with the new *Tiger* heavy tanks. From September to November two new armoured organisations were formed, *26. Pz.Div.* and *27. Pz.Div.*, and the *Waffen-SS 'LSSAH', 'Das Reich', 'Totenkopf'* and *'Wiking'* divisions were renamed *Panzergrenadierdivisionen* or *Pz.Gren.Div.* (armoured infantry divisions).

As far as the *Luftwaffe's* ground troops are concerned, in July 1942 the *Regiment (mot.) 'Hermann Göring'* (motorised or mechanized regiment) was re-structured as a brigade, although in October in was enlarged to become a division with a structure recalling the *Heer's Panzerdivisionen* one. The new name would be *Fallschirm-Panzerdivision 'Hermann Göring'*, in short *Fsch.Pz.Div. 'HG'* (armoured parachutist division *'HG').*

Meanwhile, when in autumn there was a certain heterogeneity so the situation had become a bit chaotic with much differently camouflaged vehicles deployed in the

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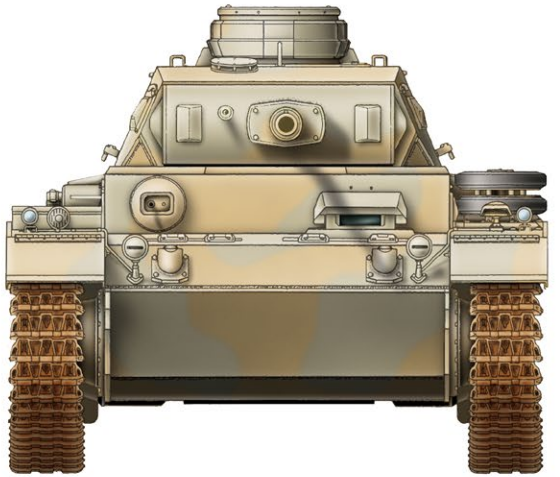
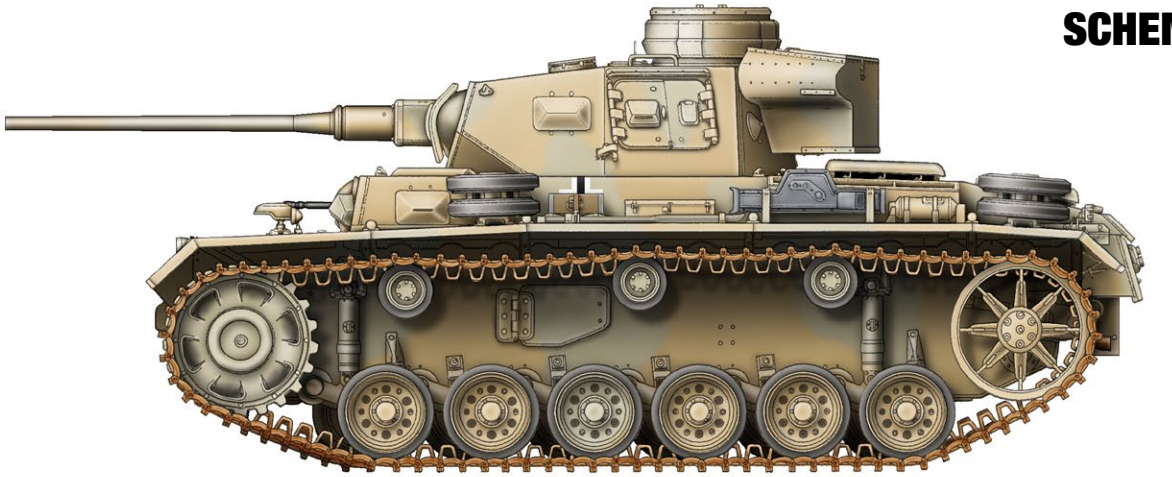
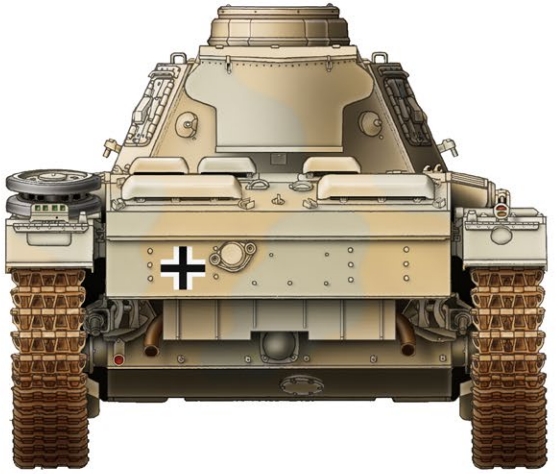
In this page. The standardised colours from March 1942 for the north of Africa were lighter than the ones considered in previous regulations. This *Sd.Kfz. 222* had a camouflage made up of gun sprayed *Grau RAL 7027* blotches onto a coat of *Braun RAL 8020*. (JCISAT / F-0178)

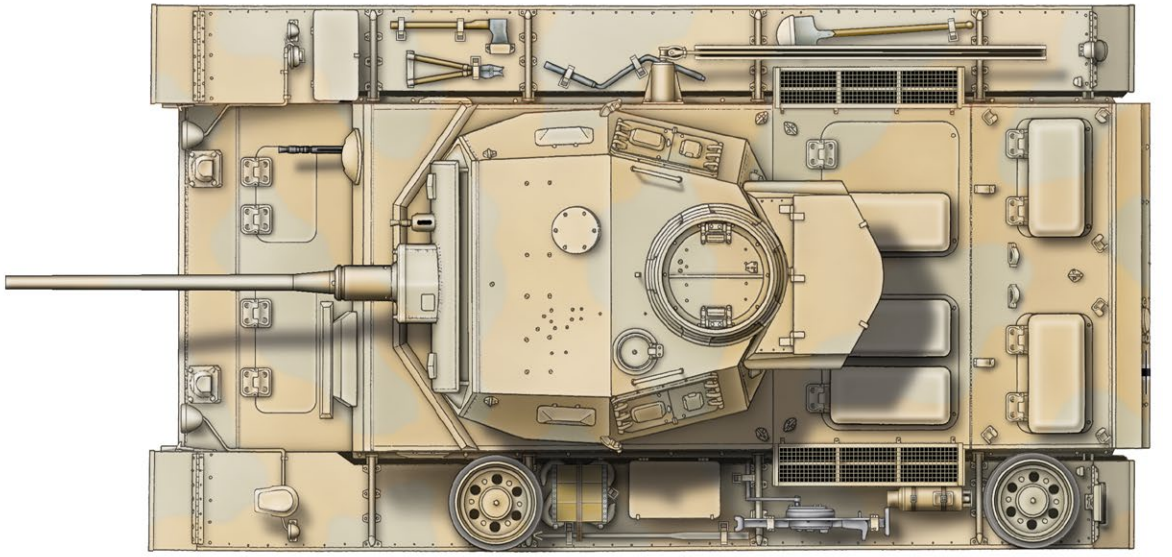
In the following page. Scheme 5. *Pz.Kpfw. III Ausf. J (Sd.Kfz. 141/1)* tank, 1942-1943. Camouflage scheme for the north of Africa in accordance with the rule *H.M. 42, Nr. 315*; it is made up of a general layer of *Braun RAL 8020* with some *Grau RAL 7027* blotches onto. These covered the 33% of the surface. (Illustration made by the author)

SCHEME 5









Pz.Kpfw. III Ausf. J (Sd.Kfz. 141/1), 1942-1943.

Panzerabteilung, February 1943

* *To identify the vehicles, go to page 126*

Stabskompanie b einer Panzerabteilung

Nachrichtenzug

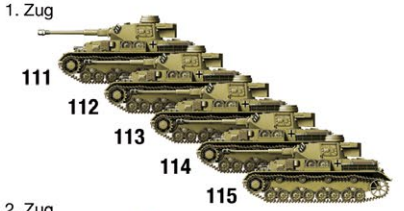
Aufklärungszug

Panzerflammzug (only by specific order)

1. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug



2. Zug

3. Zug

2. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug

2. Zug

3. Zug

3. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug

2. Zug

3. Zug

4. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug

2. Zug

3. Zug

On these lines. In 1942 the atypical schemes became a common practice in the Eastern Front just like the one in this *Pz. Kpfw. IV Ausf. F2*, painted *Gelbbraun RAL 8000* with dark *Dunkelgrau RAL 7021* or *Dunkelbraun RAL 7017* paint strokes and lighter *Braun RAL 8020* touches. (waralbum.ru)

Left above. *Panzerbefehlswagen III, 3. Pz.Div.* scrapped and left in Kharkov in 1942. It has been painted *Dunkelgrau RAL 7021*; the division emblems appear in the front plate (next to the driver's visor) and the chassis number. The tactical number in the turret matches the *I. Abt.* (waralbum.ru)

Left below. Winter 1942-1943. The *Pz.Kpfw. VI Tiger Ausf. E* and *Pz.Kpfw. III Ausf. N of schw. Pz.Abt. 502,* deployed in the Leningrad sector, were camouflaged with smudges painted *Weiss* which allowed to see the original *Dunkelgrau paint*. (waralbum.ru)

Eastern Front. Some AFVs were painted *Dunkelgrau*, some showed desert schemes while some other had camouflages made up of blotches painted diverse colours. It was clear that a new regulation was a must to fulfil the Commanders' requirements, the *OKH* had to start working. On the other hand, as winter 1942-43 approached there was no issues related to paint *Weiss RAL 9001* delivery. All units were given enough so they could camouflage the material on duty. From January 1943, they were delivered some tanks already painted *Weiss RAL 9001* coming right from the factories.

Eventually, on 18th February 1943 the *OKH* issued the Ordinance *H.M. 43, Nr. 181,* that ruled the use of a new paint, *Dunkelgelb nach Muster* (dark yellow according to standard, as a sample was supplied), to replace all the schemes which were in vigour up to this point. This shade was chosen as it seemed the perfect colour for the North of Africa, Crete and Europe.

1943, re-structuration

Early 1943, each division *'LSSAH', 'Das Reich'* or *'Totenkopf'* was reinforced with a *schw. Pz.Kp*. or company of heavy *Tiger* tanks.

In February 1943 a few armoured and motorised (mechanized) divisions got destroyed in Stalingrad or so battered after the Caucasus retreat that they have to be disbarred. The war in Africa had ended in May 1943, in Tunisia, this meant the loss of veteran units. After these huge catastrophes and with the possibility of a summer offensive, the armoured forces had to be re-structured with great effort. A few *Pz.Div*. were re-organized with the remains of such a disaster: the *10., 22.* and *27. Pz.Div*. were never re-built, while the *15. Pz.Div*. was re-organised as *15. Pz.Gren.Div*. It also happened to *Inf.Div. (mot.)*, named at that moment *Pz.Gren.Div*.; like the *60. Inf.Div. (mot.)* destroyed in Stalingrad, which was re-organised as *60. Pz.Gren.Div.* (it was renamed *Pz.Gren.Div. 'Feldherrnhalle'* later).

In this page. Spring 1943. A *Panzerjäger Marder II* crossing a Russian village. Under the worn winter camouflage (*Weiss RAL 9001*) the standard *Dunkelgrau RAL 7021* is clearly visible. The position of the cross and the size are quite unusual. (waralbum.ru)

Schwere Panzerabteilung, March 1943

*To identify the vehicles, go to page 126

Stabskompanie einer schweren Panzerabteilung "Tiger"

Nachrichtenzug

1. schwere Panzerkompanie e

Kompanie Trupp

1. Zug

2. Zug

3. Zug

2. schwere Panzerkompanie e

Kompanie Trupp

1. Zug

2. Zug

3. Zug

3. schwere Panzerkompanie e

Kompanie Trupp

1. Zug

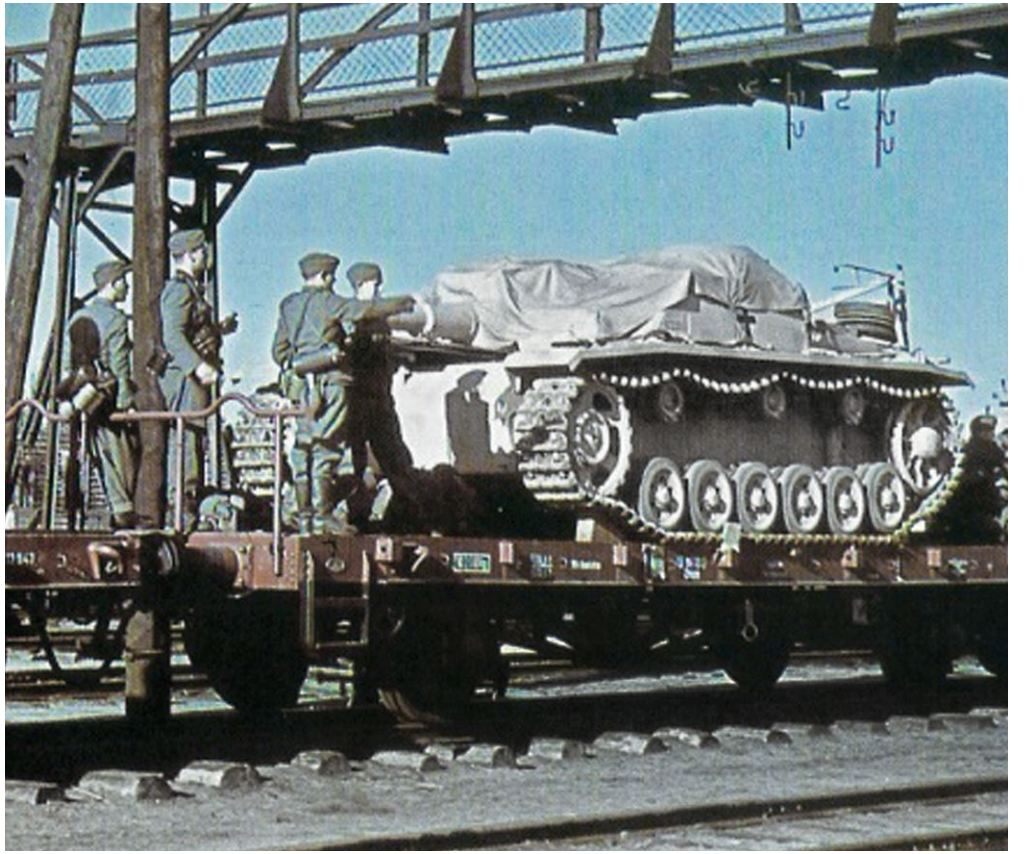
2. Zug

3. Zug

Germaine

In spring the *Panzergrenadierdivisonen* were reinforced with some armoured battalion equipped with *StuG. III*, an antitank battalion and a reconnaissance battalion. Nevertheless, the *Pz.Gren.Div. 'Grossdeutschland'*, an elite unit, which had been given a *Pz.Abt.* the previous year, relied on a complete *Pz.Rgt.* just like a *Pz.Div*.; besides, a *schw. Pz.Kp*. was attached to it before the summer so it became a *schw. Pz.Abt*. with three *Tiger* tank companies. In the meantime, new *schw. Pz.Abt.* had been formed, the increasing production of heavy tanks allowed the Germans to give these units forty-five *Tiger* each. For the whole year a few *SS-Pz.Gren.Div.* were formed too. The *Waffen-SS'* heavy tanks companies left the units they came from so three independent *schw. SS-Pz.Abt.* could be formed.

As we have previously stated and according to Ordinance *H.M. 43, Nr. 181,* dated in February 1943, the armoured material quit the factories painted *Dunkelgelb* (dark yellow). This wasn't a shade specifically developed for the war industry but a mustard yellow hue from the civil industry that had been used for a long time to paint farm machinery. It had been chosen because the war was taking place in different environments and landscapes (there were combats in Tunisia up to May 1943), therefore, it was necessary to take good profit of stocks of ochre pigment and the resulting paint was really useful in all battlefronts. This was not included in the *RAL Nr. 840 B2* chart (there was no number code). In order to specify the exact shade, a tag was added at the end *Dunkelgelb nach Muster*. A few weeks later it was given a number code and was named *Dunkelgelb RAL 7028*. At that very moment the nuance slightly turned into a greyish yellow. In any case, it seems quite probable that the manufacturers employed standard paint surpluses (used for the North of Africa and Crete) along with ochre pigment.



At the same time, the aforementioned instruction ruled the use of those colours that had to be delivered to units; the crews had to paint camouflage blotches onto the vehicles' surface, according to the Commanders' criteria, and basing on the landscapes characteristics. These colours were: *Dunkelgelb*, *Rotbraun RAL 8017* (reddish brown) and olive green, used by *Luftwaffe* to camouflage their land buildings; a few weeks later the last colour was recorded as *Olivgrün RAL 6003.* The paints were delivered in a sort of concentrated paste, packed in containers (2.00 or 20.00 kilograms) which could be thinned either with water or petrol and which could be applied with a flat paintbrush or a gun sprayer. It dried quite quickly. The regulation also insisted in a sensible use of those pastes, always the necessary minimum quantity due to the lack of raw materials and the transport and distribution costs. It was also advised to break the silhouette and the shape of the vehicles through the use of dif-

Previous page. *Pz.Kpfw. IV Ausf. G* tank (middle production). The overall coat of *Dunkelgelb RAL 7028* applied in the factory had been covered with *Grün RAL 6007* blotches. The name "Germaine" is labelled in the driver's visor armoured cover *(Fahrersehklappe).* (waralbum.ru)

In this page. *Sturmhaubitze 42* heading to Russia. The armoured vehicles were painted *Dunkelgelb RAL 7028* in the factories. Once arrived the camouflage depended on the Commander's choice. The paint was supplied in paste form (*Olivgrün RAL 6003* and *Rotbraun RAL 8017*). (waralbum.ru)

BEUTEPANZER

During World War II the Germans made good use of all kind of artillery guns and vehicles taken from their enemies. Among all those vehicles we need to emphasise the use of tanks, these were named *Beutepanzer*. After both the Polish and the Western campaigns, the captured tanks were mainly used for crew training purposes. Once launched the Eastern campaign, the Germans understood that in order to fight the Russian tanks it was absolutely necessary equipping their own tanks with much more powerful guns; a temporary solution consisted in the use of French chassis as self-propelled carriages for installing their artillery. On the other hand, the *Beutepanzer* were still on duty for personnel training purposes and were equally given to police units that combatted the guerrilla groups which operated in the rear-guard (considered terrorists).

As far as Soviet material was concerned, for the whole 1941, the German captured a huge quantity although just a part could be repaired. The light tanks were re-used as artillery tractors or were entrusted secondary tasks. Their usual operating lifetime ended once they endured serious malfunctions as there were no available spare parts. Nevertheless, both the *T-34* and the *KV-1* were highly appreciated. In fact and because the Eastern Front demanded so many resources, in 1942 the Germans focussed on repairing the captured *T-34*. These were sometimes attached to tank destroyer battalions, they were placed in the rear areas for the friend fire not to reach them in the middle of the battle.

The units were forced to inform about all material captured from their enemies; then, it was sent to rear-guard warehouses to be checked and repaired. Next, it was painted German colours and marked with big *Balkenkreuze* (bar-straight crosses). In spite of those regulations and mainly due to war conditions, when a first-line unit captured a tank it did not inform but made good use of it in combats after painting *Balkenkreuze* or Swastika in the four sides and in the roof.

In the *Heeres Waffenamt* inventory (Weapons and Army Material Department) the vehicles coming from war booties were given a German name which identified the kind of vehicle plus an origin designation, a three-digit code and a tiny letter to show the original country it came from (the letter appearing bracketed). As far as the tanks are concerned the name in short was *Pz.Kpfw*. the number starting by a '7'. The Czech ones with a (t) for *tschechisch*; Polish ones a (p) for *polnisch*; the French tanks (f) for *französisch*; the British vehicles an (e) for *englisch*; the Russians an (r) for *russisch*; the Americans an (a) for *amerikanisch* and after the fall of Mussolini, the Italian vehicles were given an (i) for *italienisch*.

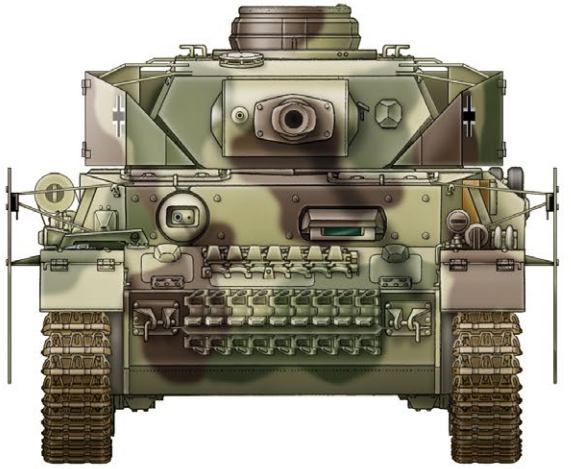
ferent colours: the best results were achieved by painting big irregular blotches. This meant a radical change as these somehow new camouflage hues recalled the old ones used by *Reichswehr* (Scheme 6).

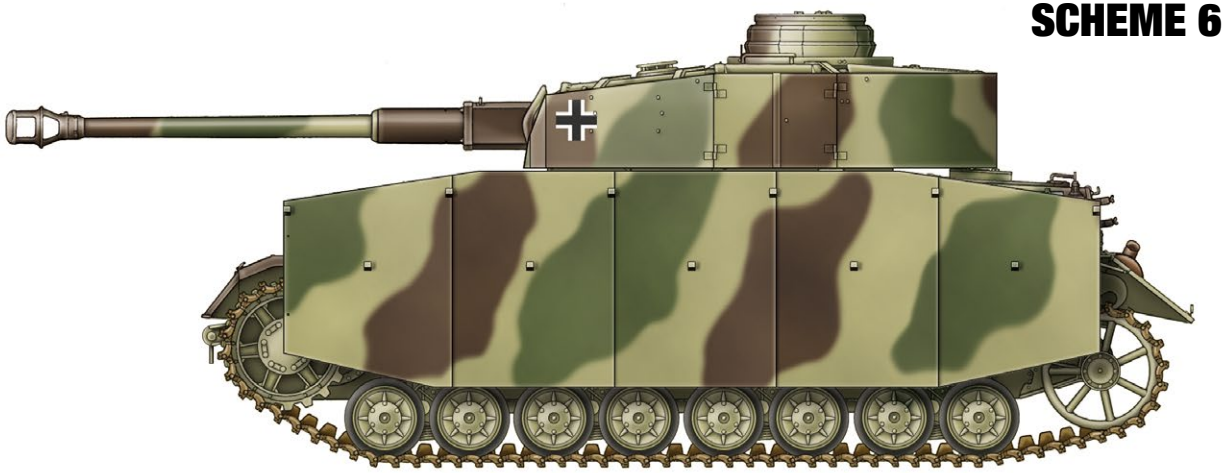
These regulations would also be adopted by the *Luftwaffe*, and on 1st April 1943 the *Luftwaffendienstvorschrift 1943, Nr. 698* (Ordinance of the Air Force in 1943, No. 698*),* in short *L.Dv. 43, Nr. 698,* got issued (compared to *Heer,* there were some differences). The colour *RAL 7028* was named *Gelbgrau* (yellow grey) and it was specified that the occupying and reserve forces should paint their vehicles and their material according to that new rule, the sooner the better, while the units deployed in

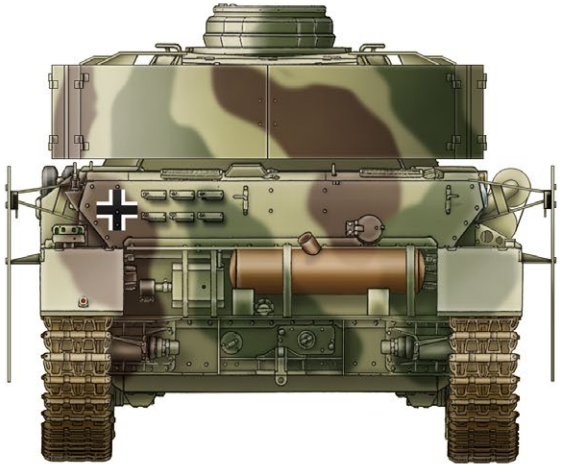
In this page. Tank built in the USSR: *KV-I (mod. 1940*) captured and renamed *Pz.Kpfw. KW-I A 753(r)* by the Germans. This one was attached to the *1. Kp./Pz.Rgt. 10 8. Pz.Div.,* for drivers' training purposes. (waralbum.ru)

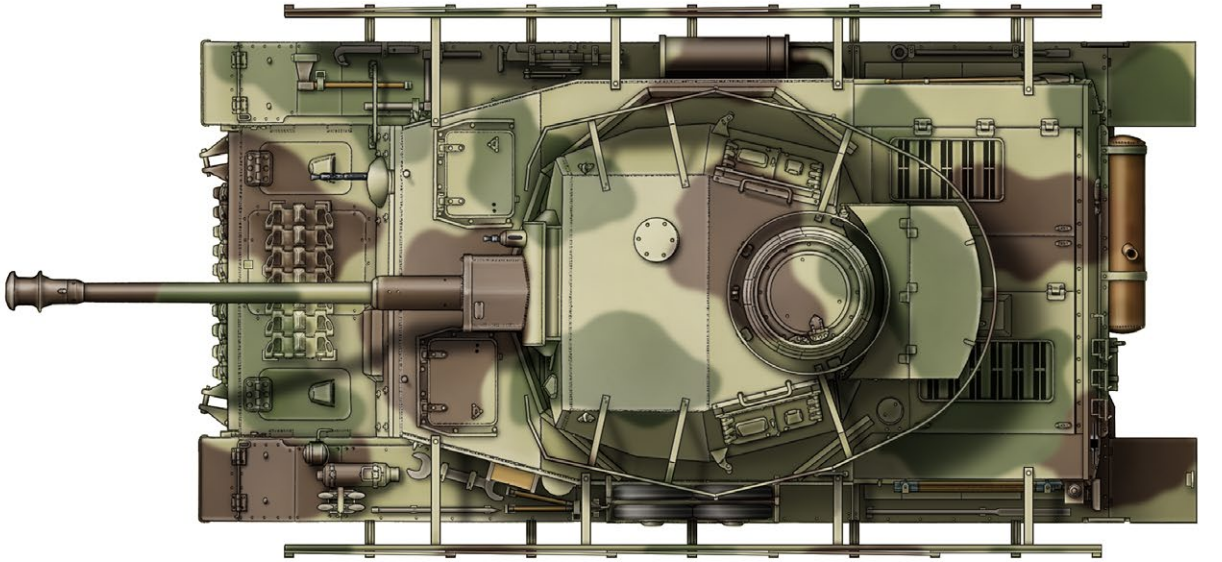
In the following page. Scheme 6. *Pz.Kpfw. IV Ausf. H (Sd.Kfz. 161/2),* 1943-1945. Scheme according to the rule *H.M. 43, Nr. 181*, made up of a general coat of *Dunkelgelb RAL 7028* with *Rotbraun RAL 8017* and *Olivgrün RAL 6003* blotches onto. (Illustration made by the author)

SCHEME 6









Pz.Kpfw. IV Ausf. H (Sd.Kfz. 161/2), 1943-1945.

Pz.StuG.Abt. (Pz.Gren.Div.), June 1943

* *To identify the vehicles, go to page 126*

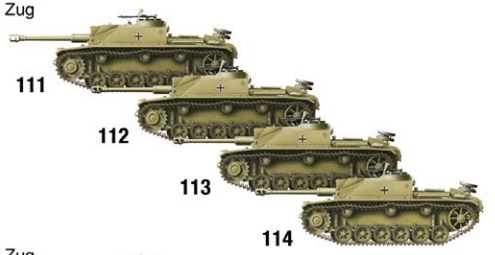
Stabskompanie einer Panzersturmgeschützabteilung

Nachrichtenzug

1. Panzersturmgeschützkompanie

Kompanie Trupp

1. Zug



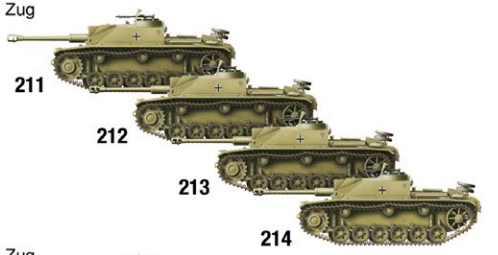
2. Zug

3. Zug

2. Panzersturmgeschützekompanie

Kompanie Trupp

1. Zug



2. Zug

3. Zug

3. Panzersturmgeschützekompanie

Kompanie Trupp

1. Zug

2. Zug

3. Zug

On these lines. Usually, the crews were entrusted the camouflage. One of the men in the picture is gun spraying paint blotches onto the armour of this *Jagdpanther* tank destroyer. His gun sprayer is connected to an air compressor (waralbum.ru)

Right, above. In the spring 1944, while it was reorganizing in France, *Pz.Rgt. 3, 2. Pz.Div.* was delivered some new tanks. These *Pz.Kpfw. IV Ausf. H* were camouflaged with a gun sprayer by making wide paint strokes of *Rotbraun RAL 8017* and *Olivgrün RAL 6003* or *Grün RAL 6007* onto *Dunkelgelb RAL 7028* applied in the factory (waralbum.ru)

Right, below. *Radschlepper Ost (Porsche typ 175)* with its new camouflage colours. From March 1943 *Dunkelgelb RAL 7028* paint turned into a slightly greyish shade, greyer than the previous *Dunkelgelb nach Muster.* This photo was taken in 1944. (waralbum.ru)

ZIMMERIT

During WWII, Germany designed a magnetic antitank mine; as it was dish-shaped it was named *Tellermine*. This was used by the infantry troopers and meant a great thread for armoured vehicles. At the possibility of the enemy using this kind of weapon, in 1943 the German chemical industry developed and anti-magnetic paste that would be covering the tanks armour through a shrivelled and rough layer to impede the mines to stick. This product was designed and developed by a Berlin firm CWZ (Chemische Werke Zimmer AG) called *Zimmerit*. It was light and poorly flammable, easily sticking to metallic surfaces and could be repaired quite quickly in campaign by the crews. According to a report written by the *British Intelligence Objectives Sub-Committee* dated in July 1945, the *Zimmerit* was made up of 40% barium sulphate, 25% polyvinyl acetate, 15% ochre pigment, 10% zinc sulphide and 10% wood fibre. The whole was diluted in benzene.

A few stages were necessary for totally apply the product; the armour surface did not require any previous work, just a layer of anticorrosive paint. Next, using a blade or a spatula a 2-mm coat was evenly applied. Then it had to dry for almost four hours and it could be hardened using the flame of a welding torch working at a 5-cm distance; the high temperatures eased the thinners to evaporate and allowed the paste to stick to the steel. Then, a second layer was applied, 4-mm thick, which was textured with the spatula or with some rollers with engraved patterns. After four hours, the welding torch was used to harden the surface of the *Zimmerit* and to remove the surplus of dampness. This was compulsory as with no welding torch it would take eight days to the paste to cure and set, which was totally unfeasible. Despite all those steps, the tanks exiting the factories had their composite not completely dry, especially in winter time.

The paste was used for the first time in October 1943, in factories and in campaign workshops. Some authors pointed out that in August it was distributed to factories. It was applied to vertical and slightly tilted surfaces, to the hull, the turret, and the casemate of all armoured vehicles on tracks (except halftracks and self-propelled artillery). That is, all those areas that could be reached by a man on foot, so a man capable of sticking or fixing a magnetic mine (Scheme 7).

On 7th September 1944, *Generaloberst* Heinz Wilhelm Guderian signed an Order that should enter into force immediately. This rule meant the cessation of the *Zimmerit* application. Two days later this file was distributed in the factories producing armoured vehicles. The cause is still unclear, perhaps a false rumour that stated that the rounds hitting the vehicle could cause flame points and turn this product into fire. Another probable motive was the increase of the weight of all those vehicles covered with *Zimmerit* which also involved a larger fuel consumption. It was necessary to make the production much simpler, on the other hand the Allies did not use magnetic mines; this stopped the use of *Zimmerit*.

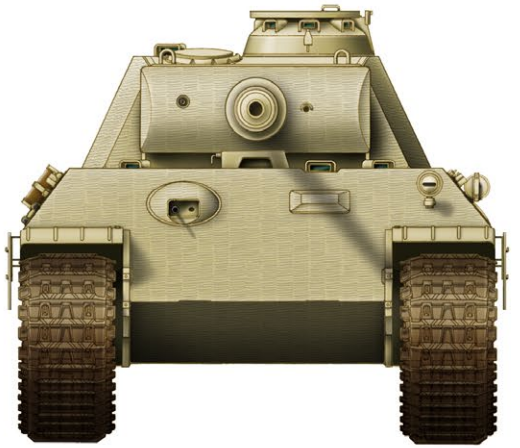
the battlefront should only do it if absolutely necessary. The paint-paste containers meant for the *Luftwaffe* were of two different weighs: the big fifty kilograms ones and the small two kilogram containers.

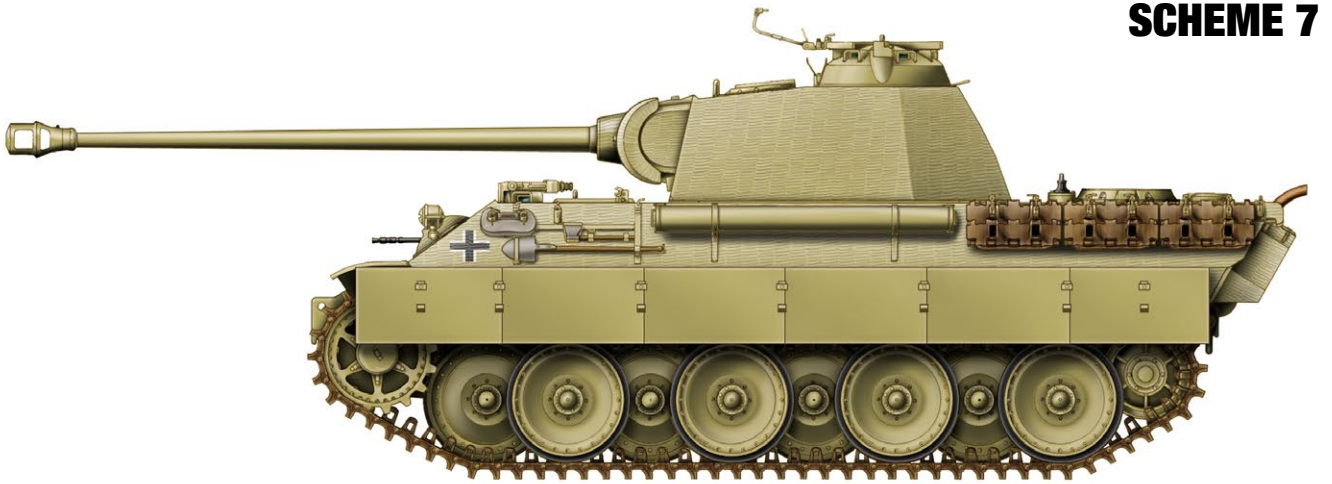
When the distribution of the paste started and in order to save paint, it was agreed that the old vehicles would not be totally repainted but just added blotches onto. *Dunkelgelb* paint was usually applied and evenly distributed (the other shades were

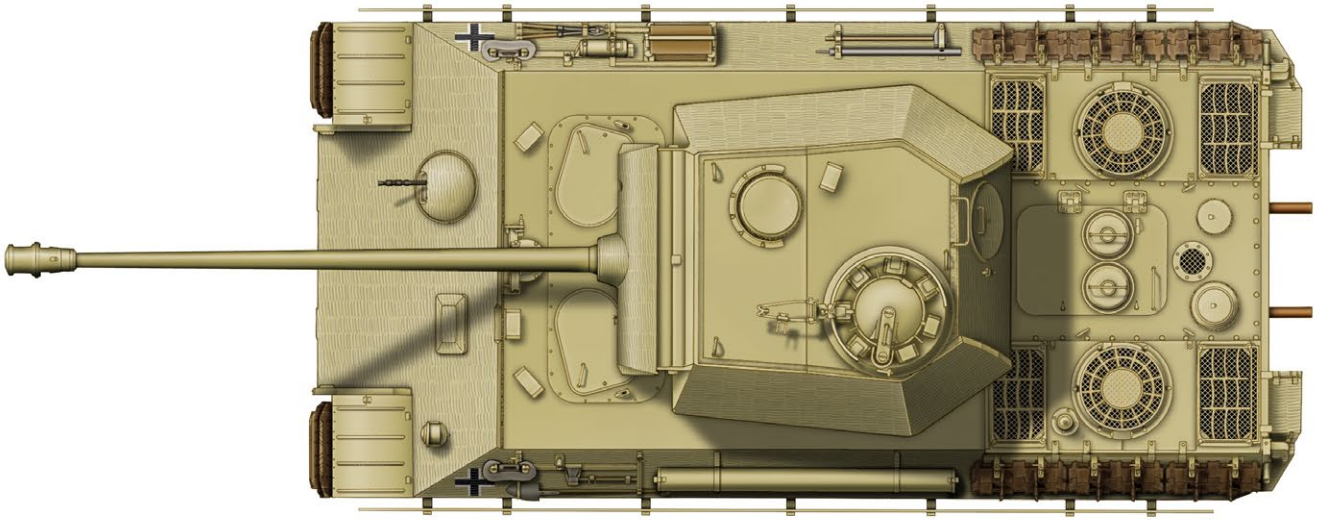
In this page. Detail of the *Zimmerit* that covered the walls of the turret. This was a *Pz.Kpfw. VI Tiger Ausf. B* attached to the *schw. Pz.Abt. 503*. (waralbum.ru)

In the following page. Scheme 7. *Pz.Kpfw. V Panther Ausf. A (Sd.Kfz. 171)* tank, autumn 1943. The *Zimmerit* is applied on the armour, the compost did not appear in the horizontal surfaces nor in the *Schürzen*. This material really increased the weight of the *Panther* up to 160 kg. (Illustration made by the author)

SCHEME 7







Pz.Kpfw. V Panther Ausf. A (Sd.Kfz. 171), autumn 1943.

unevenly distributed). Maybe because of this and as the vehicles quitting the factories painted *Dunkelgelb RAL 7028* strongly contrasted with the rest once *in situ* (the paint was so light!) the crews were forced to improvise and camouflage these using mud. Some old colours in stock were used too, particularly *Grün RAL 6007* (this one would be in use until the end of the war) but so many armoured means weren't painted any camouflage. It is necessary to point out that some tanks, assault guns and tank destroyers shown in different colour photographs taken during the 1943-1944 period, were painted light grey just the way they were when they quit the factories. We suppose that there were stocks of *Grau RAL 7027*.

As far as *Olivgrün RAL 6003* and *Rotbraun RAL 8017* were concerned (just as it happened to Dunkelgelb RAL 7028) the nuance could vary a lot. The German industry endured the lack of raw materials and the paint manufacturers, from time to time and depending on availability, were forced to deliver pigments which did not meet the standards. Therefore, among paint batches the differences could be significant (especially if they had been produced in different factories). On the other hand, both the thinner and the paint tools were responsible for the finished look of the colours. The fuel was the best thinner for paint in paste form as it became long lasting but the men were in lack of fuel in the battlefront. They usually chose water which helped (once the paint dried) to avoid abrasion. This paint could only be removed subsequently using petrol. Obviously, it was not safe water and could have some oil residues (or some liquids) so the paint became a bit more unstable and a bit less long-lasting. It also depended on the dilution degree of the paste and on the painting tool (gun sprayers for a thin coat or a few thicker coats of paint applied with a paintbrush). This made both the colour and the nuance to become quite different. *Grün RAL 6003* could vary from light olive green to dark green while *Rotbraun RAL 8017* could change from chestnut light brown to much dark chocolate**.**

On 1st July 1943 the counting of tanks and assault guns deployed in the Eastern Front amounted to 3,524. In that very date, the theoretical organisation of a *Pz.Rgt.* consisted of two battalions with four companies each, ninety-six tanks in each battalion and eight tanks in the Regiment HQ Company or *Stabskompanie* (aka a number of 200 tanks in each division). Some times and in case of special orders, seven *Flammpanzer* (flame-thrower tanks) were added. These instructions were not fulfilled in practice and so many regiments merely had one battalion with four companies while in the regiments relying in two battalions, each one had only three companies. The eastern Front demanded so much material, it was difficult to replace so the armoured groups were never completely equipped. In fact, usually there was no available material to equip the fourth platoon in each company.

The Germans deployed around 2,700 tanks and assault guns preparing Operation *Zitadelle*, the Offensive over the great salient that created the front line in the sector of Kursk. Most tanks matched the lasted variants of *Pz.Kpfw. III* and *Pz.Kpfw. IV,*

In the previous page. The *RAL 6003* and *RAL 8017* blotches did not allow the *RAL 7028* shade to appear in the *Schürzen* of this *Sturmhaubitze 42*. The shadows of the *Zimmerit* texture don't let us appreciate the shape of the blotches in the casemate and the hull. (JCISAT / F-0163)

In this page. This small motorbike tractor or *kleines Kettenkraftkrad (Sd.Kfz. 2)* and the standard trailer named *Sonderanhänger 1* were completely painted *Dunkelgelb RAL 7028*, this was usual in all vehicles operating in the second line. (JCISAT / F-0145)

Panzerregiment, November 1943

Stab und Stabskompanie eines Panzerregiments

Nachrichtenzug

Aufklärungszug

I. Abteilung

Stabskompanie einer Panzerabteilung “Panther”

Nachrichtenzug

Aufklärungszug

Erkundungs und Pionierzug

Fliegerabwehrzug

1. mittlere Panzerkompanie “Panther”

Kompanie Trupp

1. Zug

2. Zug

3. Zug

2. mittlere Panzerkompanie “Panther”

Kompanie Trupp

1. Zug

2. Zug

3. Zug

3. mittlere Panzerkompanie “Panther”

Kompanie Trupp

1. Zug

2. Zug

3. Zug

4. mittlere Panzerkompanie “Panther”

Kompanie Trupp

1. Zug

2. Zug

3. Zug

II. Abteilung

*To identify the vehicles, go to page 126

Stabskompanie b einer Panzerabteilung

Nachrichtenzug

Aufklärungszug

Erkundungs und Pionierzug

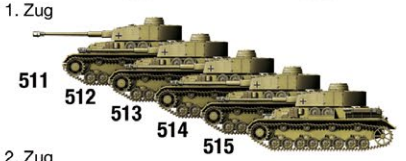
Fliegerabwehrzug

Panzerflammzug (only by specific order)

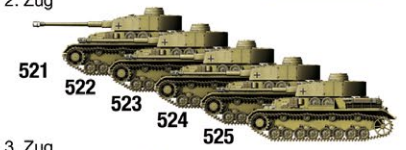
5. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug



2. Zug



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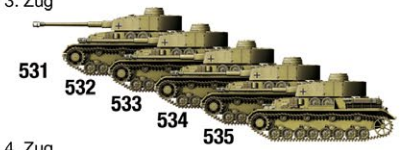
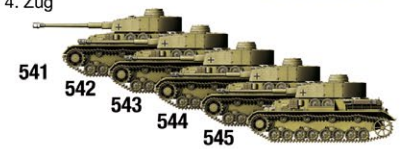


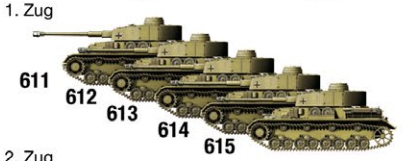
4. Zug



6. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug



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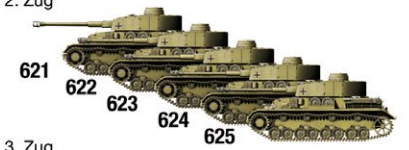
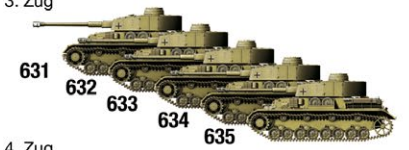
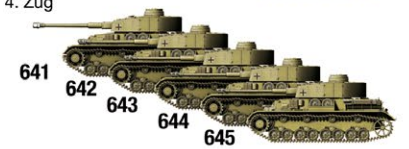


3. Zug



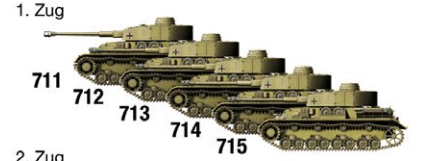
4. Zug



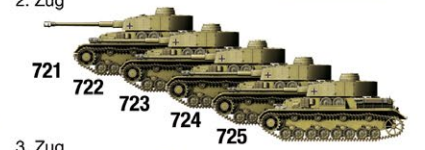
7. mittlere Panzerkompanie a

Kompanie Trupp

1. Zug



2. Zug



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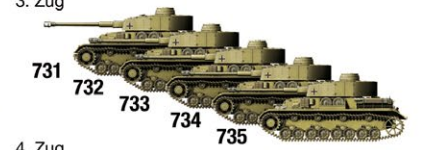
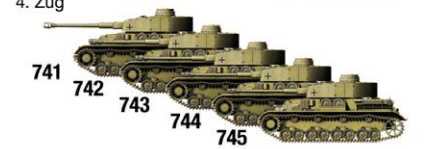


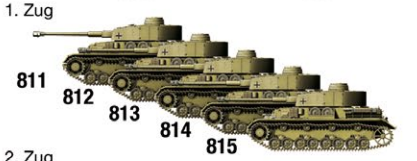
4. Zug



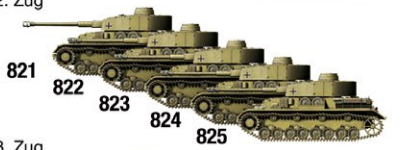
8. mittlere Panzerkompanie a

Kompanie Trupp

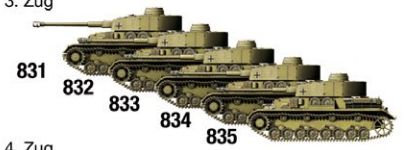
1. Zug



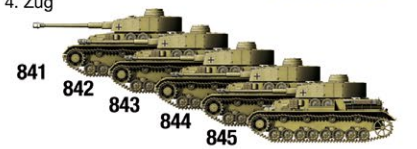
2. Zug



3. Zug



4. Zug



although some *Tiger* tanks also took active part. At the same time 200 new *Panther* medium tanks would be tested in combat. These were mainly attached to independent *10. Panzerbrigade*, a unit created with this particular purpose and attached temporarily to the *Pz.Gren.Div. 'Grossdeutschland'*, while a few vehicles were delivered to *Waffen-SS* divisions. A new tank destroyer would be tested too, the *Ferdinand* one, designed by Porsche. The battle that took place in July and was followed by a counterattack in August, involved so many important losses (around 1,500 tanks) that *Panzerwaffe* never recovered and the initiative was taken over by the Soviets; from that moment on the *III Reich* played a defensive role. Meantime, on 25th July, Mussolini had been forced from power (fifteen days after the Allied landing in Sicilia) and, fearing an Italian deception, the Germans sent troops to occupy the north of the country. The Allied landed in Salerno in September.

In fall time, the *Waffen-SS* divisions were assigned a number and some were promoted to *SS-Pz.Div*. These ones were renamed *1. SS-Pz.Div. 'LSSAH', 2. SS-Pz.Div. 'Das Reich', 3. SS-Pz.Div. 'Totenkopf', 5. SS-Pz.Div. 'Wiking', 9. SS-Pz.Div. 'Hohenstaufen', 10. SS-Pz.Div. 'Frundsberg'* and *12. SS-Pz.Div. 'Hitlerjugend'.* On the other hand, *Heer*'s *18. Pz.Div*. was disbanded in October after enduring severe losses in the Kiev area; the remainders were used to organise the *18. Artilleriedivision* (18th artillery division).

In October 1943, the tanks exited the factories painted *Dunkelgelb* plus a coat of *Weiss RAL 9002* (white), a sort of winter camouflage. The *RAL 9002*, which was also distributed among the units was enough to repaint all the vehicles on duty. This had a slightly greyish nuance especially if compared to the old *RAL 9001*. The next spring, once the ground would not be covered in snow the remainders of white paint would be removed as usual.

1944-1945, the end

Early 1944, two new armoured divisions were formed, the *Panzer-Lehr-Division* and the *116. Pz.Div.*; both had their own baptism of fire in Normandy. The first one was organised earlier that year with instructors and highly qualified staff coming from different armoured war schools, while the second one was organised with the remainders of the former *16. Pz.Gren.Div.* In June 1944, the last *Heer's* heavy tanks battalion, the *schw. Pz.Abt. 510* was organised; the *Tiger* tanks were being gradually removed from these battalions and had been replaced by new *Tiger Ausf. B*, ones also known as *Tiger II.*

In this page. Photographed in the Baltic area in 1944, this *Sd.Kfz. 251/9 Ausf. D* halftrack has been painted *Grün* and *Rotbraun* blotches so just a few tiny areas of original *Dunkelgelb* are visible. To complete the camouflage the crew placed some branches onto the armour. (Archives Ricardo Recio)

In the following page. In their way to Rome, these two soldiers of the US Army are checking a *Marder III Ausf. H* from *71. Inf. Div.* Next to division emblem, a clover, the tactical marking of self-propelled antitank company is visible. Some *Olivgrün* and *Rotbraun* blotches are applied with a paintbrush onto the *Dunkelgelb* coat. This created a motley camouflage. (waralbum.ru)

The Battle of Kursk had took place the previous year and from that moment on the German forces had been bound to gradually retreat. In April 1944, the Germans left Crimea and crossed River Bug in the southern USSR. The Allied slowly progressed in Italy, Rome fell on 4th June 1944. Two days later, the Allied landed in Normandy, a few divisions were transferred from the East to France. On 22nd June, the Red Army launched a massive attack over Belarus that broke the front, the Group of Armies Centre was destroyed and the Group of Armies North was forced to retreat to avoid the siege. The Russian Forces reached the gates of Warsaw in July and entered Eastern Prussia and the Balkans in August. On 25th August, Paris was liberated. Technically the *III Reich* had lost the War.

The German factories were enduring much fierce air raids, this disrupted the armoured vehicles' production. There had been problems with deliveries and serious lack of raw materials. Until then, each company should rely on 22 tanks but, on 1st April, the quantity was reduced to 17. In September, the theoretical organigram of a *Pz.Div*. was made up of one armoured regiment with an HQ Company (eight tanks), two battalions, one of these equipped with a *Panther (L/70)* and the other one with a *Panzer IV (L/48)* or a *Panzer IV (L/70)*, each battalion with an HQ Company (eight tanks), four combat companies with seventeen tanks each (fourteen from November) and a service company; two regiments of motorized (mechanized) infantry with two battalions each, one artillery regiment, a tank destroyer battalion, a reconnaissance battalion, one engineer (*Pionierbataillon*) battalion, an antiaircraft artillery battalion, a signal (*Nachrichtenabteilung*) group, a field replacement battalion (*Feldersatzbataillon*); a surgery medical battalion, an administration detachment, a transports detachment, a workshop and a postal service. Despite the tanks production had gradually increased, in practice the required conditions were not met and the number of armoured means was never large enough to cover the battlefront needs. Besides, more and more often, the knocked-out tanks were replaced by assault guns

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In this page. The *Zimmerit* pattern we know nowadays and which was named *Waffel* was of common use in assault guns and howitzers made by Alkett like this late *StuG. III Ausf. G.* There was ochre pigment in the composition so once the *Zimmerit* got chipped or detached because of shrapnel the contrast with *Dunkelgelb* paint was not really evident. (Archives Ricardo Recio)

In the following page. The air supremacy of the Allied forces in Normandy nearly impeded the movement of the German vehicles in daylight. The best method to mask the material for this not to be identified or to go unnoticed was to cover it with branches, like this *StuG. III Ausf. G.* (waralbum.ru)

(the production was much quicker and cheaper) and so many *Pz.Div.* were partially equipped with those assault guns. At the end the number of tanks in each company was reduced to ten.

Late 1944 the *StuG.Abt.*, then named *Sturmartilleriebrigaden* (assault artillery brigades) started to be reorganised *de facto* like real brigades, equipped with forty-five assault guns or a mix of assault guns and tank destroyers and a *Begleit-Grenadierbatterie* (battery of supporting grenadiers).

For the whole 1944, the supplies were getting more and more scarce, the *III Reich* was enduring fiercest Allied air raids. The production of both fuel and weapons got affected. When the combat units were delivered new vehicles these were exclusively painted *Dunkelgelb*, as we have written before. The harassed units really had very little time and energy to paint camouflage blotches (in addition, paint was rarely available). The first thing the crews did was tying branches to the armour or the hull to hide the vehicles from the enemies' aviation. A provisory solution that showed to be quite effective anyway. Besides, the campaign workshops in the rear-guard had also very little time, the men could repair the vehicles but could not paint them before sending them back to the first line. In August, the *Heeres Waffenamt* ordered the manufacturers to deliver all armoured vehicles already painted with camouflage blotches (onto the general *Dunkelgelb* layer some big blotches with well-defined edges painted *Olivgrün* and *Rotbraun*). On the other hand, it was necessary to standardise the camouflages so a bunch of specifications was prepared focusing on three basic schemes meant for different seasons.

In the previous page. The best method to mask an armoured vehicle or at least to make the identification so difficult was to cover it with branches, tied with a wire along the surface, just like this *StuG. III Ausf. G*. See, close to it, a destroyed Russian tank *T-34/76* model 1943. (JCISAT / F-0141)

In this page. Artillery material captured by the Allied Forces in Normandy. Note onto the *Dunkelgelb* layer *Rotbraun RAL 8017* and *Grün RAL 6007* (dark green shade), or *Rotbraun RAL 8017* and *Olivgrün RAL 6003* (medium green shade) camouflage blotches. The self-propelled ones are solely painted *RAL 7028* and *RAL 6007*. (Archives DBA)

Schwere Panzerabteilung, August 1944

*To identify the vehicles, go to page 126

Stab und Stabskompanie schweren Panzerabteilung "Tiger"

Gruppe Führer

1. schwere Panzerkompanie a

Gruppe Führer

1. Zug

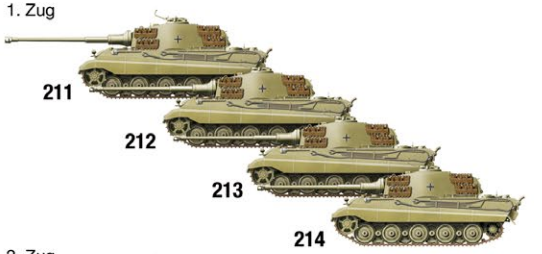
2. Zug

3. Zug

2. schwere Panzerkompanie a

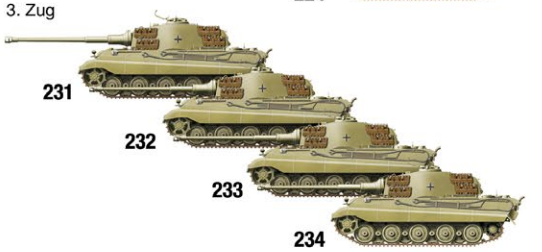
Gruppe Führer

1. Zug



2. Zug

3. Zug



3. schwere Panzerkompanie a

Gruppe Führer

1. Zug

2. Zug

3. Zug

On these lines. In the mudguard of this *Mercedes-Benz 170V (W36)* a shield with a black bison (this was the insignia of the *schw. Pz.Abt. 508*). This car, like the *Pz.Kpfw. Tiger Ausf. E* in the background were painted *Dunkelgelb RAL 7028*, *Grün 6007* and *Rotbraun 8017*. (waralbum.ru)

Right, above. Like some other tanks belonging to the *26. Pz.Div.* photographed in Italy, this early *Pz.Kpfw. IV Ausf. H* had a complicated camouflage with smudges and bits of *Grün* and *Rotbraun* distributed in a random way to darken the general look. (waralbum.ru)

Right, below. This photo was taken in Belgium in December 1944, this late *Pz.Kpfw. V Panther Ausf. G* has a three-colour pattern designed for the end of the summer and the beginning of the autumn. The position of the crosses, in both sides of the turret is quite unusual. (waralbum.ru)

The first one was meant for the end of the summer and the beginning of the autumn and consisted in big *Olivgrün RAL 6003* and *Rotbraun RAL 8017* blotches distributed over a layer of *Dunkelgelb RAL 7028*, so each colour would cover approximately 1/3 of the vehicle surface. These blotches had to be completed with a mottled pattern of each colour onto the shade which was placed next. This scheme would be known as *Hinterhalt* (ambush) and simulated the *chiaroscuro* effect produced by the sun rays through the foliage and was excellent to hide the tanks in the middle of the forest (Scheme 8).

The second one was meant for the late autumn till the end of the winter period and was made up of a general layer of *Weiss RAL 9002* which had to totally cover the vehicle although some complementary blots were allowed using some different hues. This scheme was a perfect one for all grounds covered by snow.

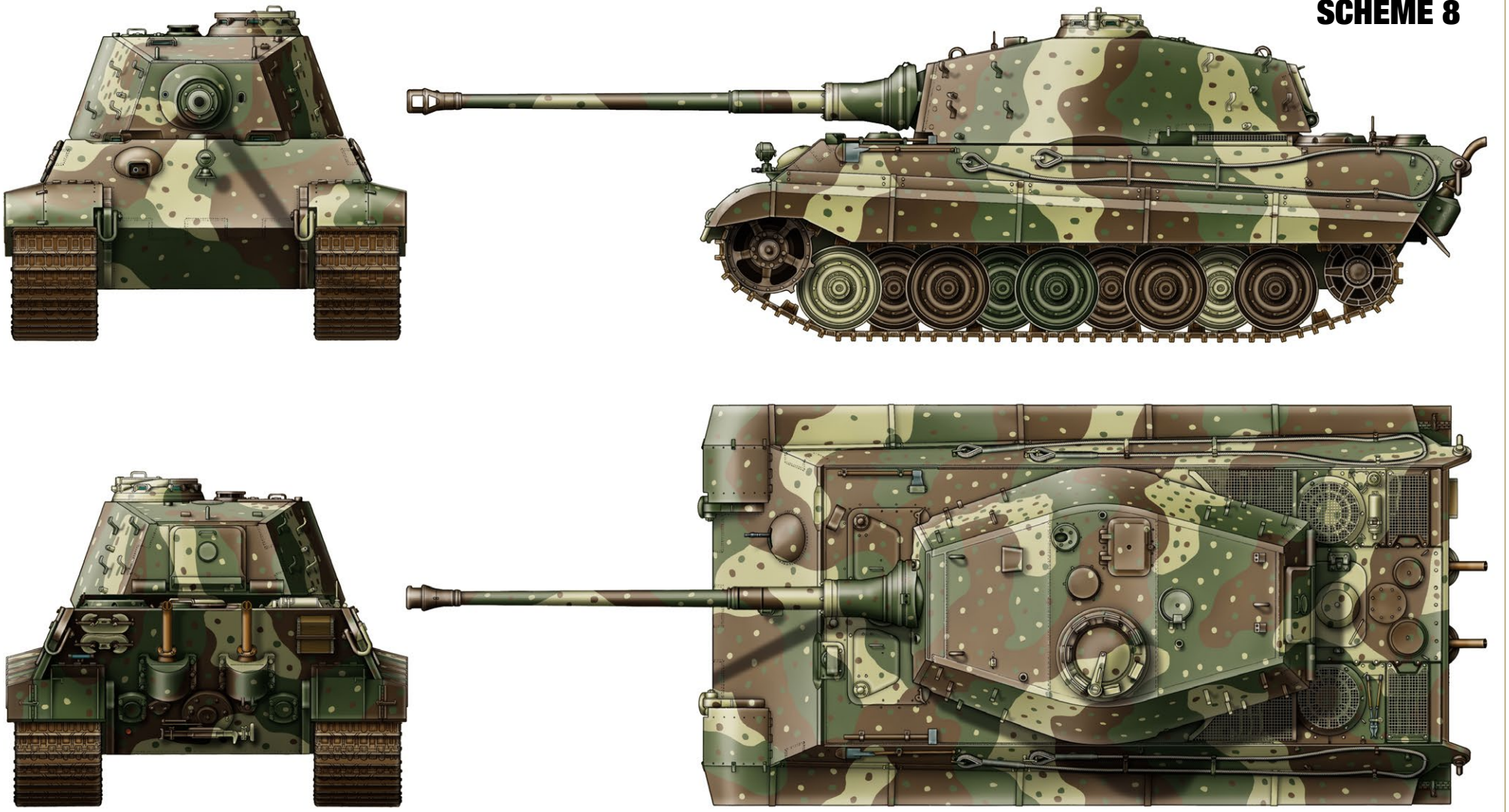
The third one was thought for springtime and early summer, and consisted of a *RAL 6003* base with big *RAL 8017* blotches and thin *RAL 7028* lines. The final general colour was pretty dark, excellent when vegetation was so lush.

At the end of August a great number of armoured vehicles were exiting the factories painted the first scheme (sometimes with no mottled pattern at all, this probably to be on time or to save paint). This caused that in September, only *Dunkelgelb* and *Olivgrün* hues were applied (sometimes just the first one) directly painted onto the antirust primer *Rot RAL 8012* (brownish red) that covered the armour plates. In November, the third scheme was being applied in the factories. The camouflage blotches could be painted with a big flat paintbrush or with a gun sprayer (usually a gun sprayer); the highly qualified personnel was entrusted this kind of work. They worked with the paint gun sprayer and made good use of stencils and templates so the edges of the blotches were not blurred but precise and sharp. In any case, the serious lack of raw materials make the compliance of the rule so difficult and a great number of tanks exit the factories solely painted *Dunkelgelb* or added *Dunkelgelb* blots onto the *Rot* primer.

In this page. The outstanding air supremacy of the Allied forces reduced the movements of the German vehicles during the day, as once these were in movement it was quite simple to spot them. This *Pz.Kpfw. IV Ausf. J* was destroyed in France by US aviation. (waralbum.ru)

In the following page. Scheme 8. *Pz.Kpfw. VI Tiger Ausf. B (Sd.Kfz. 182)* tank, 1944-1945. Camouflage scheme for the spring or the beginning of the summer. Big blotches and small specks are mixed using the following colours: *Dunkelgelb RAL 7028*, *Rotbraun RAL 8017* and *Olivgrün RAL 6003*. (Illustration made by the author)

SCHEME 8



Pz.Kpfw. VI Tiger Ausf. B (Sd.Kfz. 182), 1944-1945.

Panzerregiment, November 1944

Stab und Stabskompanie eines Panzerregiments

Gruppe Führer

Aufklärungszug

I. Abteilung

Stab und Stabskompanie einer Panzerabteilung “Panther”

Gruppe Führer

Aufklärungszug

Erkundungs und Pionierzug

Fliegerabwehrzug

1. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

2. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

3. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

4. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

* *To identify the vehicles, go to page 126*

Pz.Fliegerabwehrzug

II. Abteilung

Stab und Stabskompanie einer Panzerabteilung "IV"

Gruppe Führer

Aufklärungszug

Erkundungs und Pionierzug

Fliegerabwehrzug

5. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

6. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

7. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

8. Panzerkompanie

Gruppe Führer

1. Zug

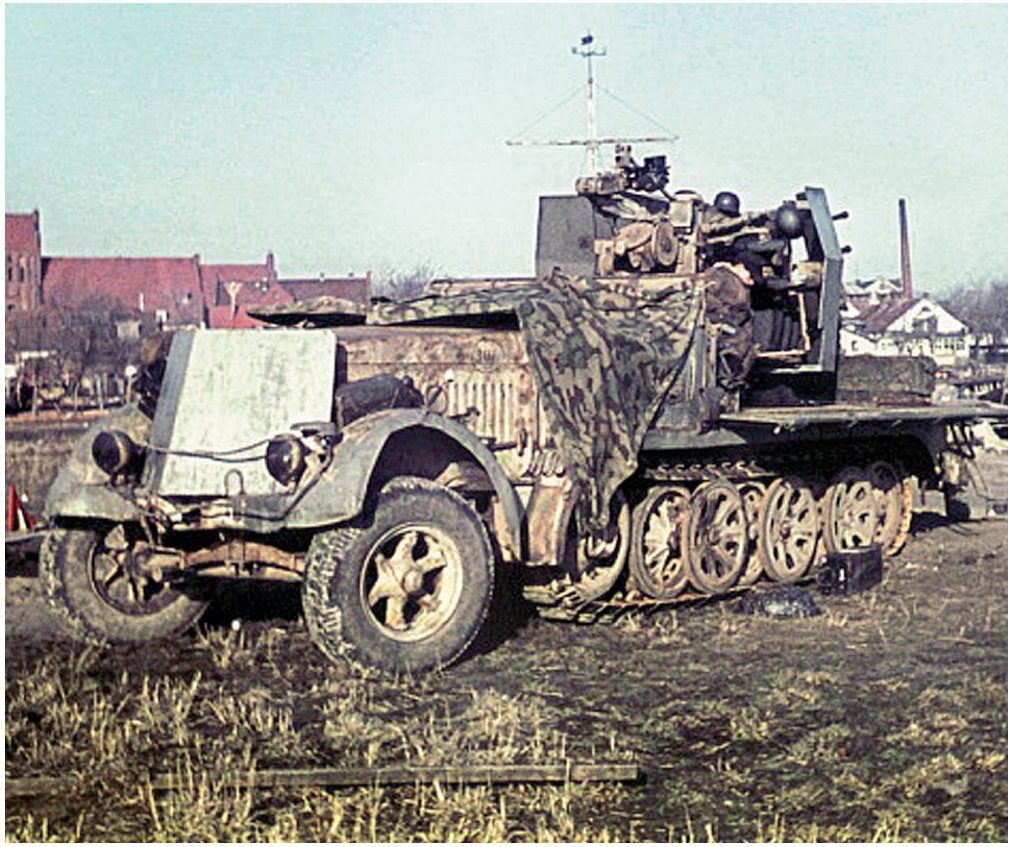
2. Zug

3. Zug

Because of that lack of raw materials, the manufacturers had been ordered on 25th August to stop painting the inner part of the tanks and assault guns (just a coat of primer: *Rot RAL 8012*). Obviously it gave rise of all sorts of complaints and on 23rd January 1945 it was ordered to paint the inner part of the *Panzer* turrets using *Elfenbein RAL 1001.* As far as the *StuG*. were concerned, the area from the line of the mudguards to the roof of the casemate was painted too.

In October, the *Fallschirm-Panzerkorps 'HG'* (parachutist armoured corps *'HG'*) was organised with two divisions, the one called *Fsch.Pz.Div. 1 'HG'* and the recently formed *Fsch.Pz.Gren.Div. 2 'HG'.* Two months later, the *Panzerkorps 'GD'* (armoured corps 'GD') was formed: this was made up of the *Pz.Gren.Div. 'GD'* and the *Pz.Gren. Div. 'Brandenburg'.*

On 16th December the German launched a brave attack over the Ardennes, the Operation *Wacht am Rhein* (lookout in the Rhine). At that very moment the number of tanks operating in the Western Front added up to 1,216. The first advance was successful but soon the Operation got bogged down when the fuel was scarce and this forced the units to retreat to the starting point. The battle lasted a month and a half and the last reserves got exhausted; around 610 tanks and assault guns got lost. Anyway, these would be much more necessary in the Eastern Front as the Soviets had launched the offensive by the mid-January.



In 1945, the organization chart of the *Panzerdivisionen* had to be re-structured to adapt to the available vehicles: one of those two battalions in each armoured regiment was turned into a *Panzergrenadiere* or mechanized infantry, with no tanks, while the other one (presumably) should be organized having four companies (two *Panzer IV* and two *Panther* companies). In practice, all vehicles of any kind and able to shoot, were attached to these *Panzerabteilungen*, more particularly the *StuG. III*. assault guns. This new structure removed any formal differences between a *Pz.Div*. and a *Pz.Gren.Div*.

On 2nd January 1945 a new Ordinance was in vigour, *H.M. 45, Nr. 52,* which ruled the military vehicles newly manufactured and regulated the use of *RAL 6003* as a base colour instead of *RAL 7028*. On the other hand, the use of *RAL 7028* was specifically

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In the previous page. Daimler-Benz premises, October 1944. Equipped with viewer and infrared projector *FG1250.* This *Pz.Kpfw. V Panther Ausf. G* has been added *Olivgrün* and *Dunkelgelb* blotches and specks right onto the antirust *Rot RAL 8012* primer. The primer is clearly noticeable in the wheels. (waralbum.ru)

In this page. Eastern Prussia, March 1945. This old *Sd.Kfz. 7/1* was painted *Dunkelgrau RAL 7021* in the factory; under a worn coat of D*unkelgelb RAL 7028*, the old hue is noticeable. In one side of the hood the number "307" has been labelled inside a circle. The windshield and the cab are covered with a camouflage fabric named *Zeltbahn.* (waralbum.ru)

forbidden for all big vehicles as these became too noticeable and visible from the air when they were transported in railway platforms. The rule equally focussed on multicolour camouflage schemes and stated that *Olivgrün RAL 6003, Rotbraun RAL 8017* and *Gelb RAL 7028 Ausgabe 1944* (yellow *RAL 7028* variant 1944) should be applied in order each colour would cover the same area as the other hues. The reference to *Gelb RAL 7028 Ausgabe 1944* lead us to think of the lack of ochre pigment (huge reserves got lost in France and Italy), so in 1944 the necessary quantity of *Dunkelgelb* paint could not be produced. To solve this issue and from that moment on, the composition of the paint had to be altered to cover the needs and that made the shade to significantly vary. Despite the chaos caused by the massive raids some manufacturers started to meet the regulations although they usually were forced to adapt to both the paint and the means' availability. That is, so many armoured vehicles exited the manufactures exclusively painted *Dunkelgelb* or added *Dunkelgelb* and *Olivgrün* blotches (or diverse green hues from different origins) applied directly onto the *Rot RAL 8012* primer. It seemed that from time to time, the old *Dunkelgrau RAL 7021* was used to make camouflage blots in some three-colour schemes.

In January 1945 the *Führer Begleitbrigade* and the *Führer Grenadierbrigade*, created the last autumn were promoted (exclusively in name) to *Panzerdivisonen.* From January to March some new armoured units were formed with personnel from reserve and training units or from remainders of some destroyed divisions and were assigned a reduced number of armoured vehicles. Some of these such as *Pz.Div. 'Holstein', 'Schleisen' ('Döberitz')* and *'Jüterbog'*, were torn apart to reinforce the battered units deployed in the front line of the battle, while the *232. Pz.Div. ('Tatra')* was annihilated a few weeks after reaching the battlefront. Some other such as *Pz.Gren. Div. 'Kurmark'* or *Pz.Div. 'Müncheberg'*, would combat until the survivors were taken prisoners at the end of the war. In March, the *Pz.Div. 'FHH 1'* and the *Pz.Div. 'FHH 2'* were formed using the remainders of both the *Pz.Gren.Div. 'Feldherrnhalle'* and the *13. Pz.Div.* (both destroyed in Budapest). April 1945 saw the start of *Pz.Div. 'Clausewitz'* organisation although this unit was still incomplete in May. The last months and weeks were chaotic, *Kampfgruppen* (groups of combat) were organised with remainders of units destroyed in combat; these groups were mainly improvised and consisted of infantry units supported by some tanks or assault guns. In fact, during that confusing period the organic structure had disappeared.

On 7th May 1945, a week after Hitler committed suicide, *Generaloberst* Alfred Jodl, Chief of the General Staff for the High Command of the Armed Forces (*OKW*), signed in front of the Allies the instruments of the *Wehrmacht's* unconditional surrender; the operations would cease on 8th May 1945 at 23:01 P.M. It was estimated that, at that very moment, the *Panzerwaffe* still counted on around 2,900 armoured vehicles.

In this page. This *Jagdpanzer 38 (Sd.Kfz. 138/2) Hetzer* tank destroyer was photographed in the Skoda premises in Pilsen at the end of the war. The three-colour camouflage pattern was achieved by high-qualified personnel that made good use of stencils. Next to the front peephole, three black fake peepholes have been painted to fool the enemy shooters. (waralbum.ru)

In the following page. Germany, March 1945, an American soldier carefully checking an abandoned *Panzerjäger Jagdpanther.* The tank destroyer was painted *Olivgrün RAL 6003* in the factory but because of the paint applied randomly, the *Rot RAL 8012* primer is still visible in some areas. (Archives DBA)

Panzerregiment, November 1944

Stab und Stabskompanie eines Panzerregiments

Gruppe Führer

Aufklärungszug

I. Abteilung

Stab und Stabskompanie einer Panzerabteilung “Panther”

Gruppe Führer

Aufklärungszug

Erkundungs und Pionierzug

Fliegerabwehrzug

1. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

2. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

3. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

4. Panzerkompanie

Gruppe Führer

1. Zug

2. Zug

3. Zug

*To identify the vehicles, go to page 126

Pz.Fliegerabwehrzug

II. Abteilung

Stab und Stabskompanie einer Panzerabteilung “IV L/70”

Gruppe Führer

Aufklärungszug

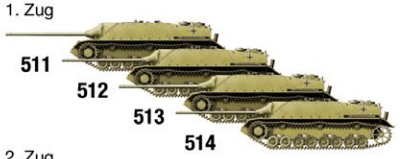
Erkundungs und Pionierzug

Fliegerabwehrzug

5. Panzerkompanie

Gruppe Führer

1. Zug



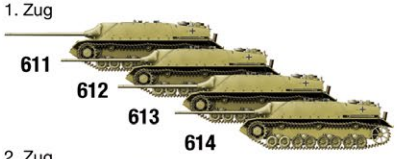
2. Zug

3. Zug

6. Panzerkompanie

Gruppe Führer

1. Zug



2. Zug

3. Zug

7. Panzerkompanie

Gruppe Führer

1. Zug

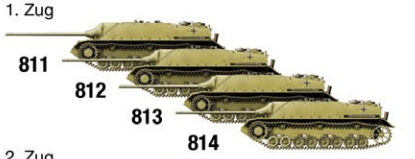
2. Zug

3. Zug

8. Panzerkompanie

Gruppe Führer

1. Zug



2. Zug

3. Zug

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CAMOUFLAGE SCHEMES AND UNITS' EMBLEMS

In all those pages previous to this chapter, we have made a further revision on the colours used by the German Army during the 1914-1945 period. These shades were mainly used to camouflage vehicles and artillery guns. From 1937, there were different ordinances or guidelines issued from OKH *referring to the use of paints. In spite of so many changes made, a result of the experience in wartime, there was a certain agreement about the patterns in use. In the last part of World War II some armoured vehicles were painted camouflage patterns that reminded the schemes applied to* Sturmpanzerwagen *(assault tanks) during WWI.*

During World War I it became evident that applying camouflage to artillery guns was absolutely necessary. After conducting experiences with different shades, it was agreed that the best ones were *Ocker, Grün* and *Braun*. There was no compulsory law in the Army regarding the painting standards so the universal *Feldgrau* colour, used to paint all material, could substantially vary depending on manufacturers and batches. This statement is true if we consider a few complementary colours which were, so often, the only ones available at a very particular moment in a very particular location. As far as the assault tanks are concerned, at the beginning, these were painted with any material or shade on hand. Soon after, the personnel deployed in *B.A.K.P. 20* headquarters was assigned their camouflage. Sometimes, they were able to achieve quite complicated and fancy patterns.

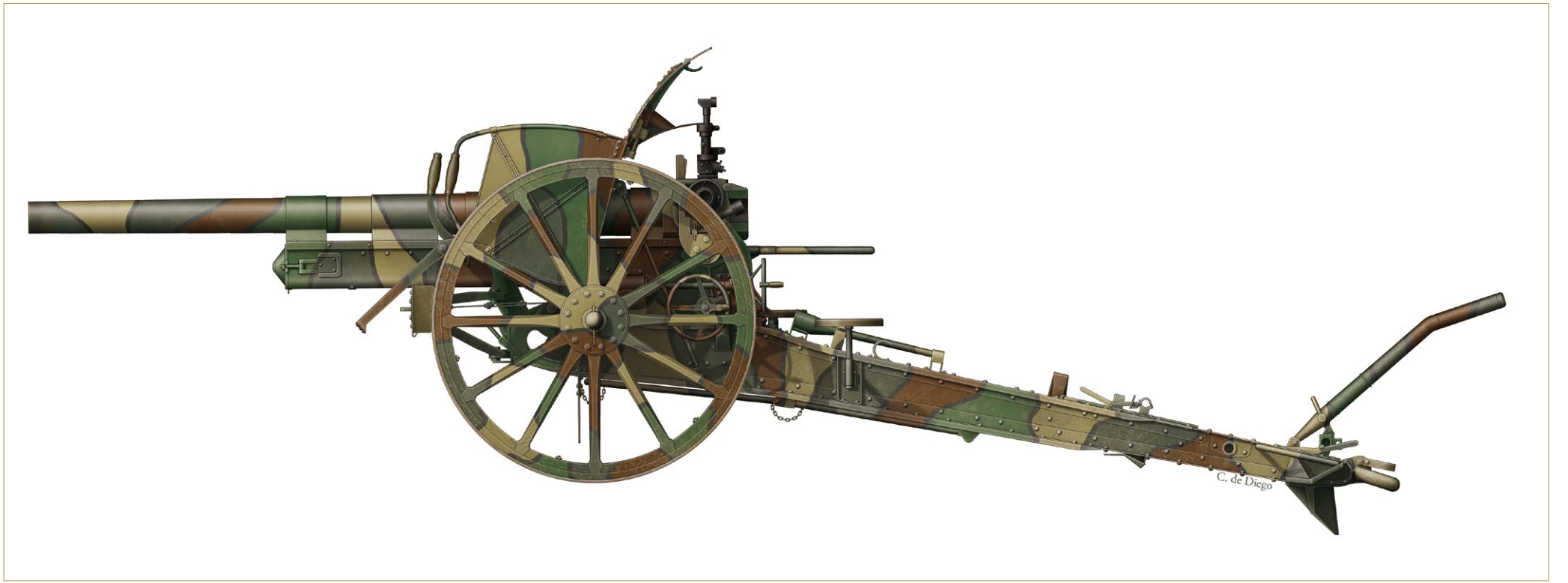
In 1923, during the *Reichswehr* period, a pattern was ruled for every military vehicle made up of blotches and using colours reminding the ones in use during the War, this time named *Erdgelb*, *Grün* and *Braun.* That pattern was in vigour until 1937; a couple of years after the forming of the *Wehrmacht,* new colours such as *Dunkelgrau* and *Dunkelbraun* were introduced. The new scheme showed to be excellent to hide the material either in the shadows of the buildings or in the woods but was much inappropriate when in open field. In any case, it was a lesser evil as *Panzerwaffe* had been developing at a dizzying pace during the *Blitzkrieg.* For the whole Eastern campaign, the old colours were employed to paint camouflage blotches.

Later, the course of events led to substantially change the camouflages. In 1943, the use of a new universal standardized colour was ruled; we are referring to *Dunkelgelb* which was meant to be added some blotches of *Rotbraun* and *Olivgrün* at the discretion of the unit Commander. So many times, the camouflage patterns depended on the availability of these two colours, so in 1944 the *OKH* ordered the manufacturers to deliver already camouflaged vehicles and to use *Olivgrün* paint as background colour.

In the previous page. The heavy *Jagdtiger* tank destroyers were built from February 1944 to May 1945. These were delivered to *schw. Pz.Jäg.Abt. 512* and *653*. The pictured one had been in the *schw. Pz.Jäg.Abt. 653*. The blotches of the camouflage scheme had been directly gun sprayed onto the *Rot RAL 8012* primer. (waralbum.ru)

In this page. When the *Dunkelgelb* was put in use, the vehicles on duty were camouflaged with *Dunkelgelb* blotches painted onto the old shades. This *Waffen-SS Sd.Kfz. 250/1* was painted at first *Dunkelgrau* and *Grün* or *Dunkelbraun*. (waralbum.ru)

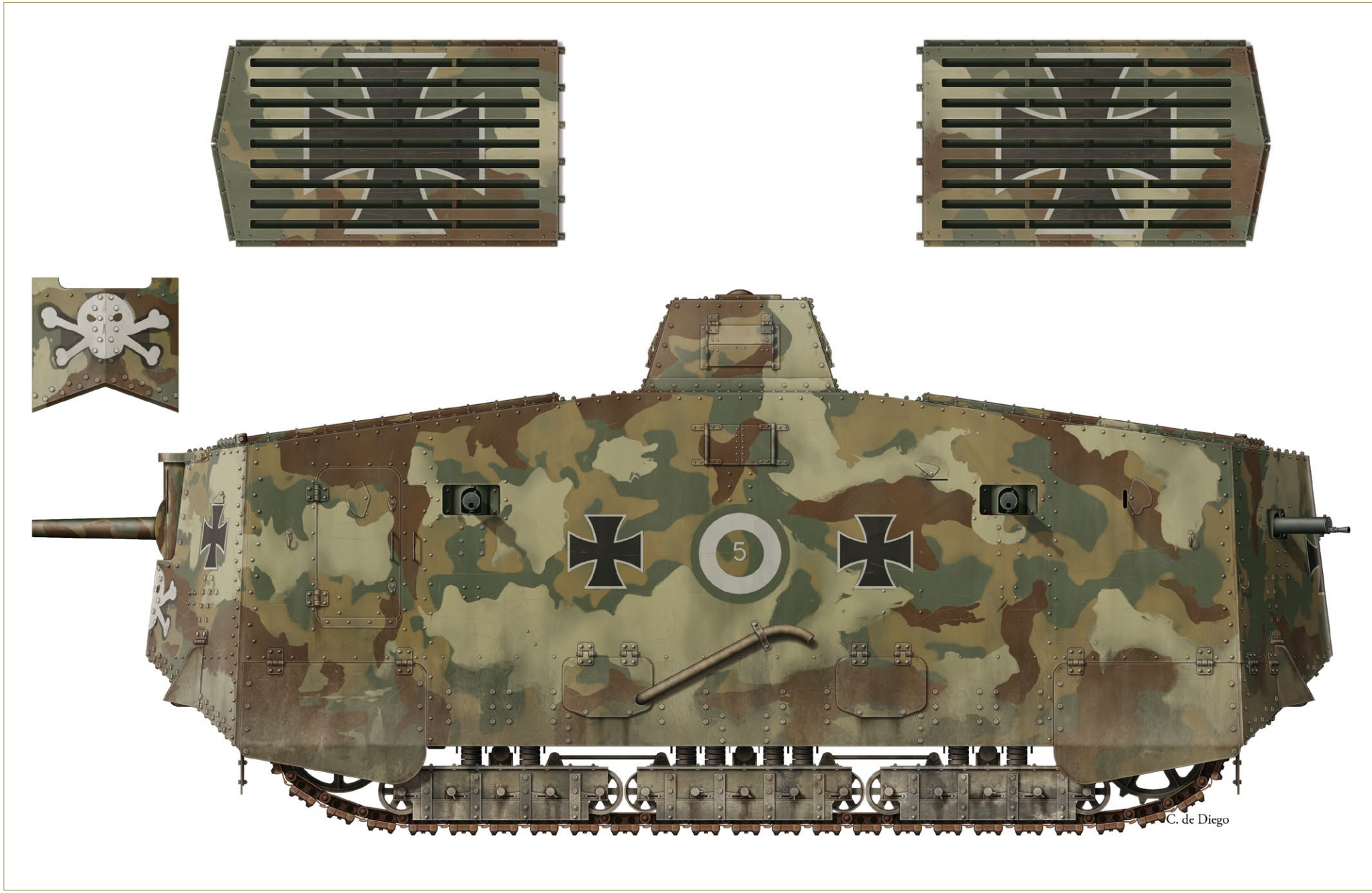
7,7 cm leichte Feld Kanone (l.F.K.) 16, Western Front, 1917



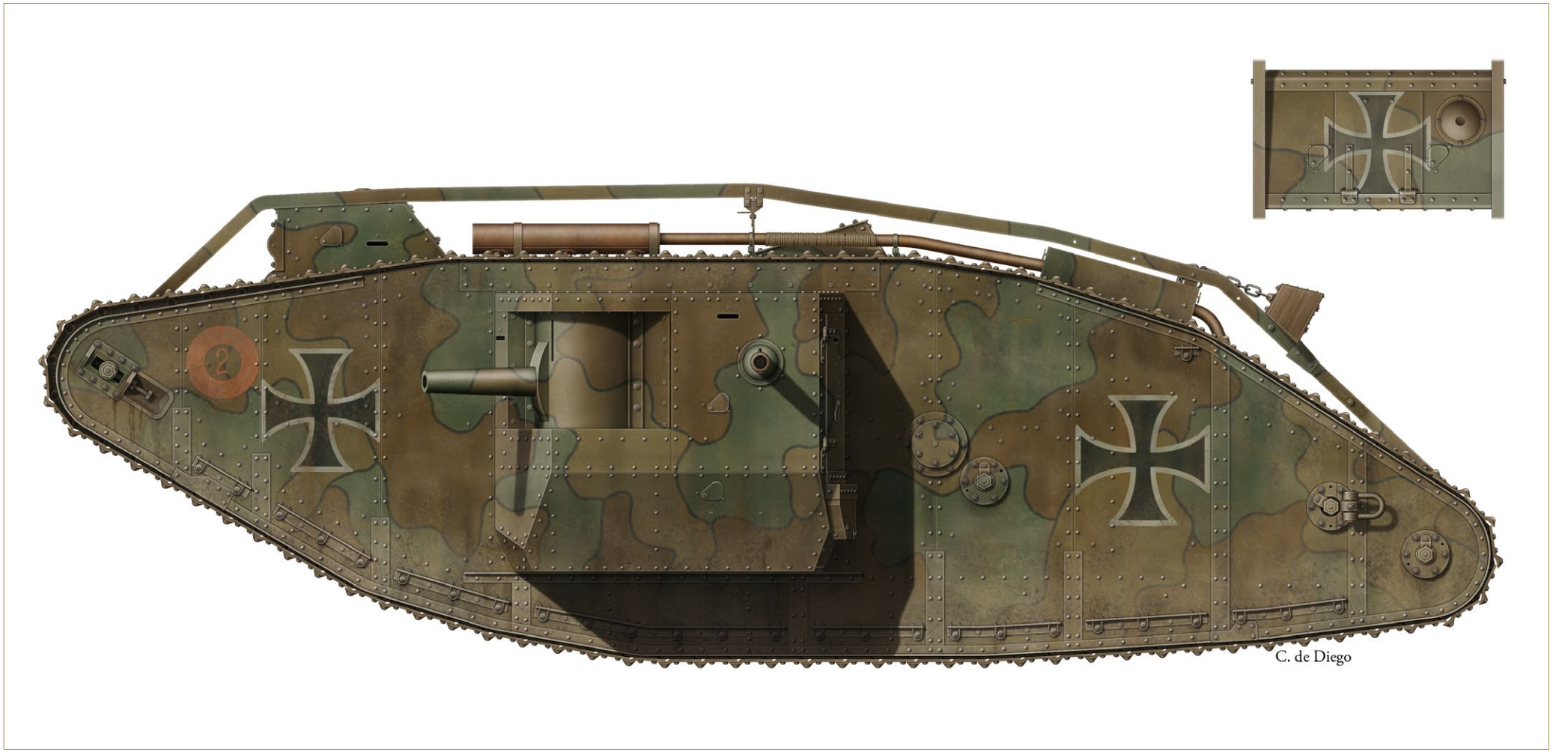
On these lines. The research ordered by the *Reichsheer* Command referred to camouflage of artillery pieces was undertaken in the 1916-1917 period. The air observation revealed that the best colours for the material to go unnoticed were *Braun, Grün* y *Ocker* so the use of these shades became general and usual. Nevertheless, very often, it was necessary to take into consideration available shades. Usually two or three different colours were applied to paint the camouflage blotches. Sometimes these blotches were profiled with some black paint like in the light 7.7-cm calibre campaign gun model 1916. Notice the following shades: *Braun, Grün*, *Ocker* and original *Feldgrau* separated by black lines. This scheme was applied frequently to the steel helmets worn by assault troopers and from September 1918 it was in use in tanks too (obviously with much bigger blotches).

In the following page. This vehicle, from the second production batch, exited the Daimler factory painted medium *Feldgrau*. It was delivered to *Abt. 1* in April 1918 and was camouflaged, using a paintbrush, with blotches of three different colours. Probably two different shades of *Lehmgelb*, lighter and darker ones, along with *Rotbraun*. It is feasible that the shades were *Lehmgelb*, *Rotbraun* and *Grün*.
The *Abt. 1* was the only detachment which used a unit emblem: skull and crossbones appearing in the bow of all assault tanks. In May, this unit adopted the number system which was already in use in the detachments equipped with captured tanks. A small number, that showed the position of the tank in the unit, was outlined in both sides and was surrounded by a big ring. As it was the first detachment, both the ring and the number were painted white. The national emblem, the *Eisernes Kreuz* or Iron Cross, was put in both the right and the left of the ring and the rear part of the hull and also in the big aeration grilles in the roof (oversized) in order to ease the identification (for both aviators and German artillery watchers). This *A7V* had also two crosses in the bow, one at each side of the gun. Early October 1918 a new model of cross was adopted, the *Balkenkreuz* or straight cross (Greek).

A7V Sturmpanzerwagen 562 "Herkules", Abteilung 1, River Matz, France, 9 June 1918



Schwerer Kampfwagen (Beute), Abt. 12, Briey, France, September 1918

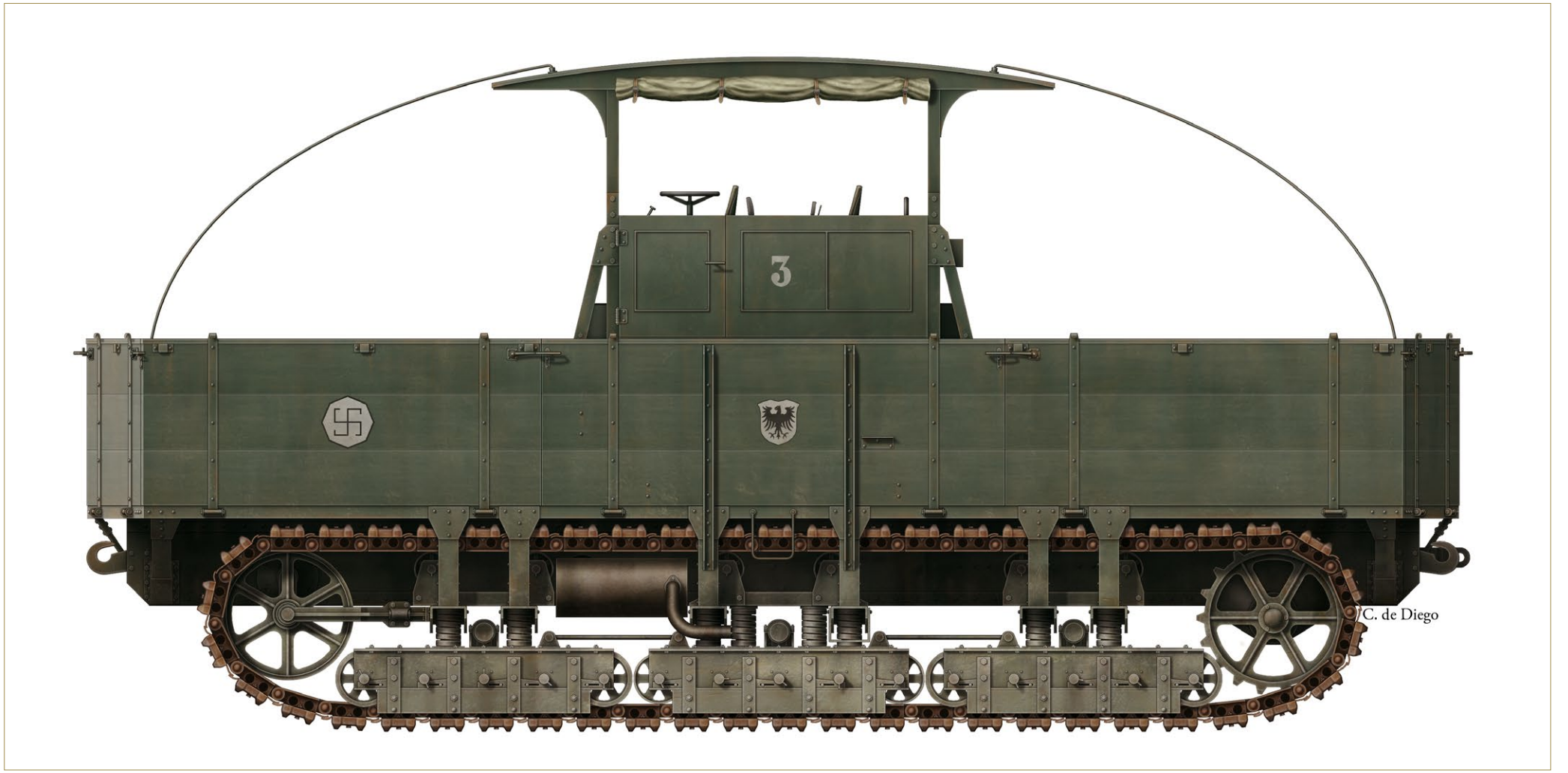


The two 6-pounder British guns were replaced in the *Beutepanzer Male* by some 5.7-cm Maxim Nordenfelt (same model as the ones in the *A7V*). As the shields were smaller than the original ones, the gaps between the shields and the armour had to be sealed using steel stripes. On the other hand, the ball mount of the front machine-gun was adapted to assemble a 13-mm *Tankgewehr* antitank rifle. Besides, the difficulty of adapting the side ball mount to assemble the German *MG 08* machine-guns forced to keep the British *Lewis*. These had to be converted to shoot 7.92-mm German ammunition. The illustration shows one of these tanks, more particularly the second tank in *Abteilung 12*, which can be identified because of the red colour of the ring-shaped tactical marking. A particular hue had been assigned to each detachment *Abt. 11* (white), *Abt. 12* (red), *Abt. 13* (yellow), *Abt. 14* (blue), *Abt. 15* (green) and *Abt. 16* (brown). The armoured vehicle had a new camouflage scheme named *Buntfarben Anstrich*, made up of *Feldgrau*, *Rotbraun* and *Ocker* blotches outlined by *Schwarz* lines. It was an early variant of the pattern so none of the colour stood out and the blotches had a pretty irregular shape. The national emblems (the Iron Crosses) were present in the sides, in the front and the rear parts of the hull and on the casemate's roof (see further detail).

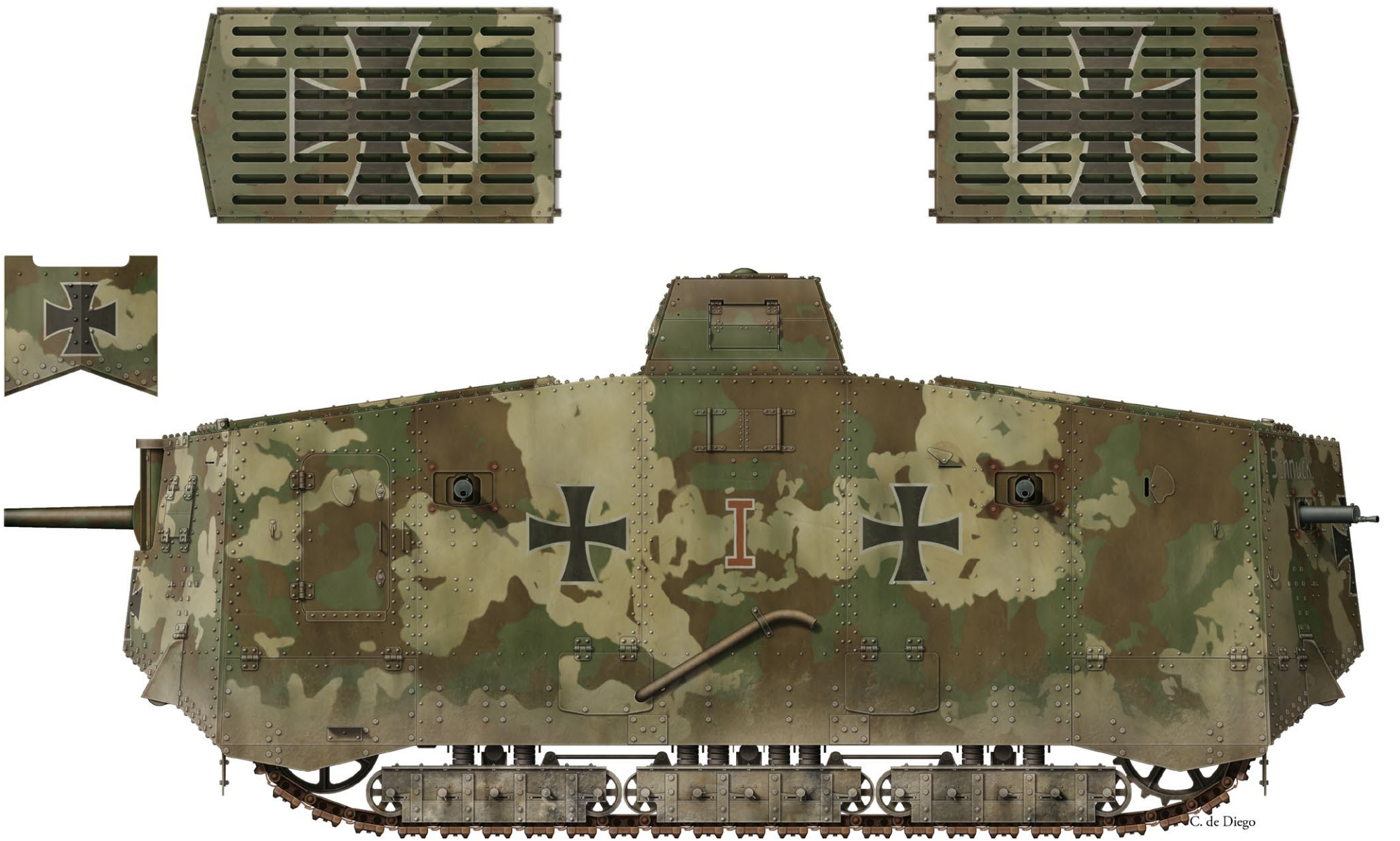
A7V Geländewagen, A.K.K.(R) 1111, north of France, April 1918

The *Geländewagen*, also known as *Überlandwagen*, was a vehicle on tracks devoted to the transport of supplies and ammunition. This is one of the eight vehicles, with chassis numbered 508 to 515, which were attached to the first experimental transport column named *Armee-Kraftwagen-Kolonne (Raupe) 1111* or 1111 Army Automobile Column (on tracks). The unit was formed late September 1917 and was sent to the north of France in November where it was on duty until the end of the War.

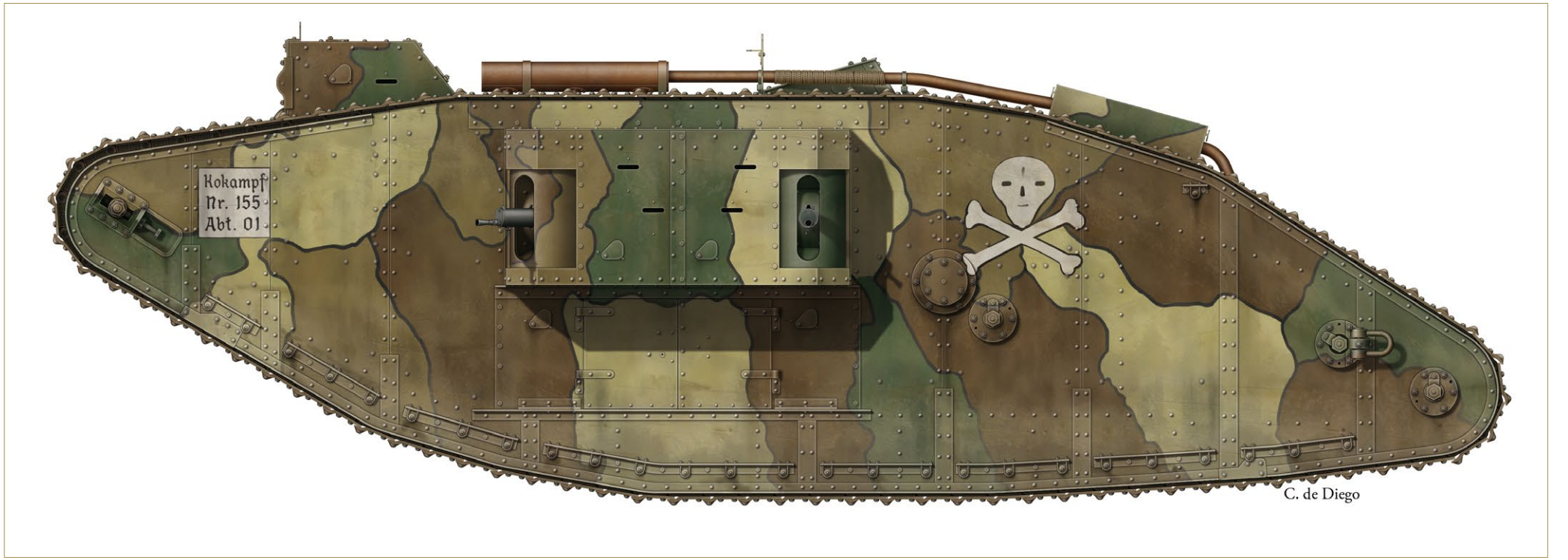
The *Geländewagen* were only painted *Feldgrau* (the illustration shows the darker variant of this hue) and had the number of the chassis labelled white in both the front and the rear parts of the chassis and the imperial eagle in the sides of the loading platforms. Some of those vehicles had registration numbers painted in both bow and stern (left side) but not in this case. The *A.K.K. (R) 1111* emblem was a white octagon with a slender *Swastika* inside. Besides, this drawing can be found in both the front and the rear parts of the loading platform but this time to the right. We can see a white "3" figure in the sides of the cab. That means this was the third vehicle of the column.



A7V Sturmpanzerwagen 504 "Schnuck", Abteilung 2, Fremicourt, France, 31st August 1918



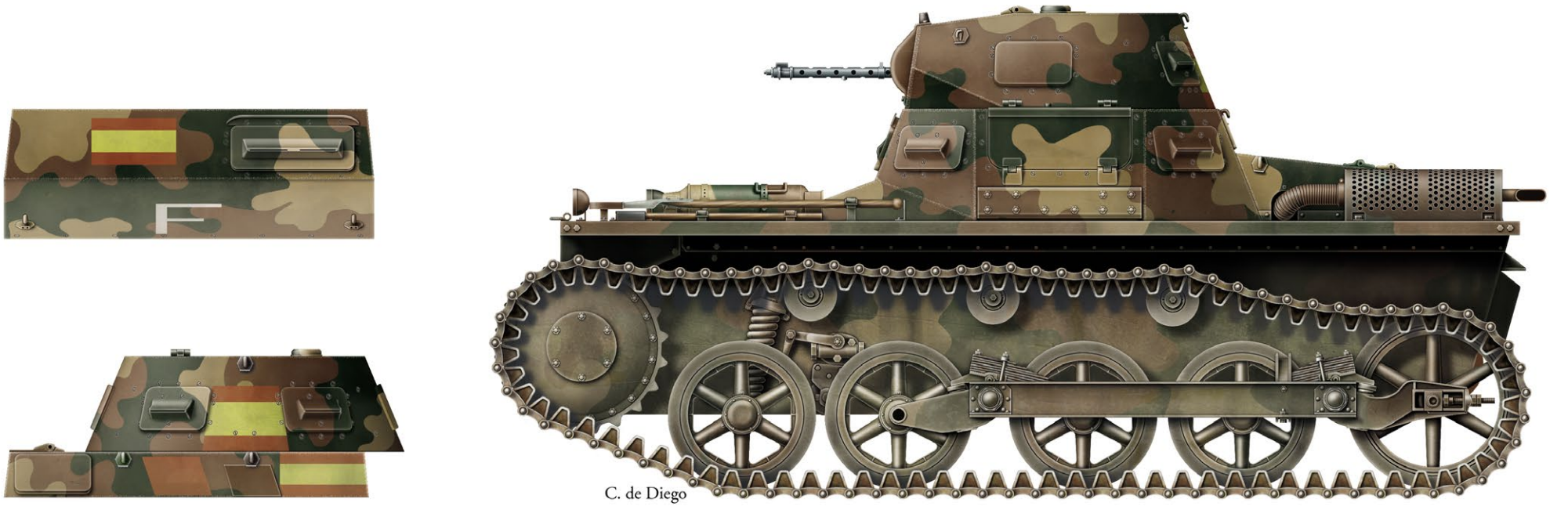
Schwerer Kampfwagen (Beute) 155, Kokampf, Leipzig, Germany, 19th May 1919



In the previous page. Until September 1918 there was no default camouflage scheme, the shape of the blotches painted in the armour was pretty irregular. This *A7V* from the first production batch and with Krupp armour shows the usual set of colours: big blotches of *Lehmgelb* and *Rotbraun* onto a general layer of *Feldgrau*. A usual practice was giving the tanks their own names, the *A7V* with chassis number 504 was given the name of *"Schnuck",* labelled white in the upper right corner of the bow and the upper left corner of the stern.
The assault tanks in the *Abteilung 2* had Roman figures labelled, from "I" to "V", to identify their position in the unit. From April to May these numerals were white and were put, in duplicate, in the front and the rear parts of the hull, in both sides of the crosses. Before the end of May the numbers were removed and were outlined in the centre of each side armour plate, just where the cross had been drawn. Then the inside was filled with red, the shade that matched the *Abt. 2.* New Iron Crosses were painted in the sides of the numbers, so there were two crosses in each side, one in the front, one in the rear part and two in the roof.
As we had written, the white colour matched the *Abt. 1* while the red hue matched the *Abt. 2*. Theoretically the yellow shade matched the *Abt. 3,* but a numbering identification system was never used.

On these lines. This is one of the *Beutepanzer* or booty tanks *Mk. IV Female* employed by the *Kokampf*. In all the *Mk. IV* the original *Lewis* machine-guns had been modified to shoot German rounds but this vehicle is equipped with *Maschinengewehr 08* or *MG 08*, the *Reichsheer* standard machine-gun. On the other hand, it has no characteristic rails to cut wire fences usually along the upper part of the hull. It is painted the multicolour camouflage scheme, according to regulations issued in September 1918, named *Buntfarben Anstrich.* That pattern consisted of big blotches in three or four different colours outlined with *Schwarz*; the hues appearing in the illustration are *Feldgrau*, *Rotbraun,* light *Lehmgelb* and dark *Lehmgelb*. Behind the sponsons, in both sides, there is a skull with crossbones which was the *Freikorps* emblem. Just in front of these, a white frame with the phrase *Kokampf Nr. 155 Abt. 01* is visible.

Pz.Kpfw. I Ausf. A (Sd.Kfz. 101), Panzergruppe Drohne, Madrid, (Spain), December 1936

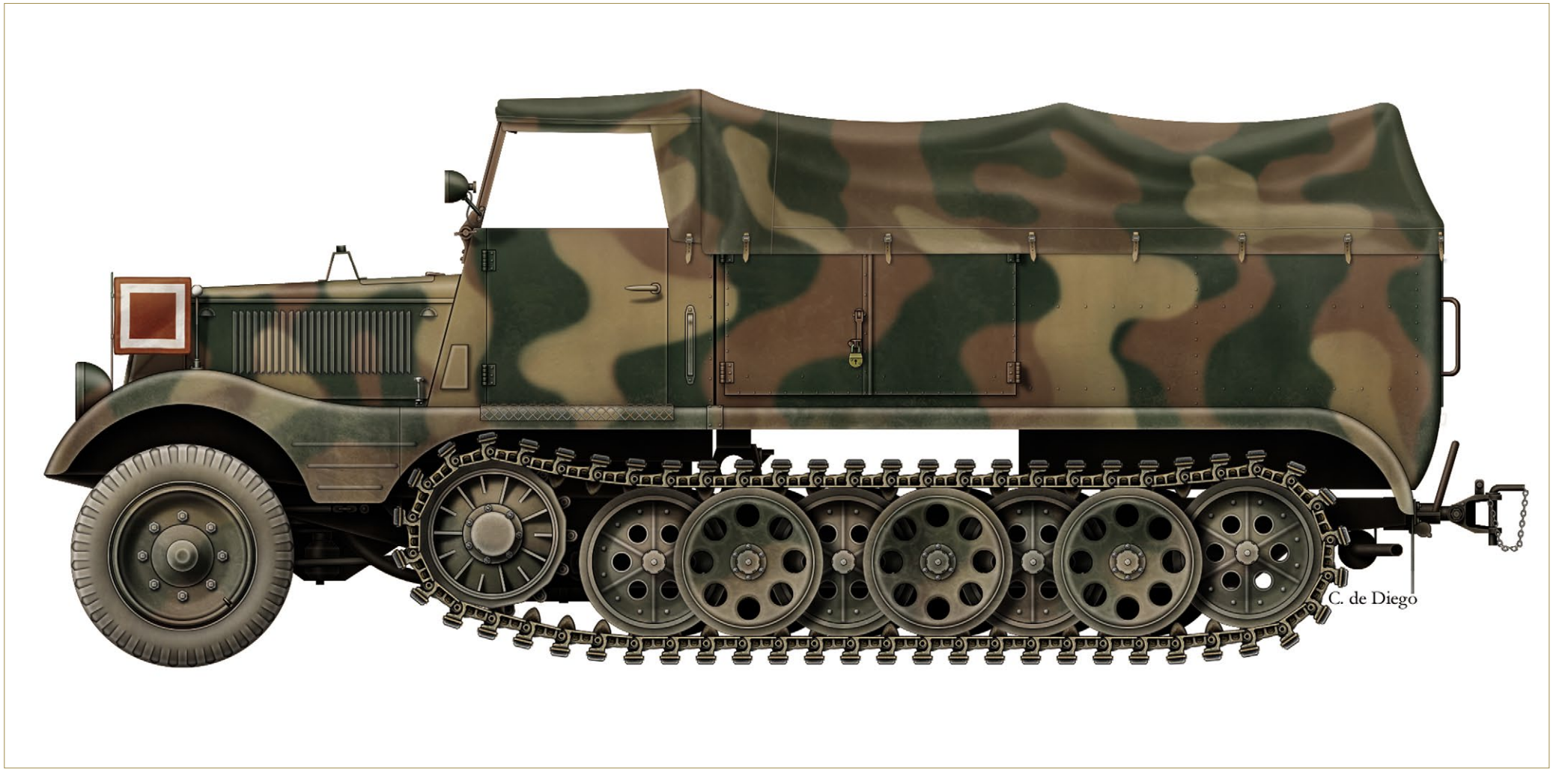


A *Heer* contigent operating in Spain under the code name *Gruppe Imker* (Beekeeper Group) was attached to *Panzergruppe Drohne* (Armoured Group Drone), also known as *Panzergruppe Thoma* after the family name of the Commander. The Group was made up of personnel coming from *Pz.Rgt. 6* of *3. Pz.Div*. Then, a contingent from the *Pz.Rgt. 4* of *2. Pz.Div.* joined them. In December 1936 it had HQ coy, three tanks companies, a transport company, a workshop company, a training antitank unit and an armoury. Along with different transport vehicles and 37-mm antitank guns, it also had three Command *Panzer I*, thirty-eight *Panzer I* model *A* (one of these with no upper structure, for the drivers' training) split into the first and the second companies and twenty-one *Panzer I Ausf. B* in the third company. Each company had three sections of five tanks and a command tank, the remainders were supposed to cover the losses.

These tanks were camouflaged according to regulations dated on 1933. Also, Spanish Monarchic flags were painted in the front and the rear in order to minimize the risk of these vehicles to be mistaken with those employed by the enemy. During the first part of the war, the *Panzer I* was also painted a rhomboid in the rear of the combat chamber whose colour could vary depending on the company. The position of the vehicle in the company was shown by a white lettering labelled in the glacis.

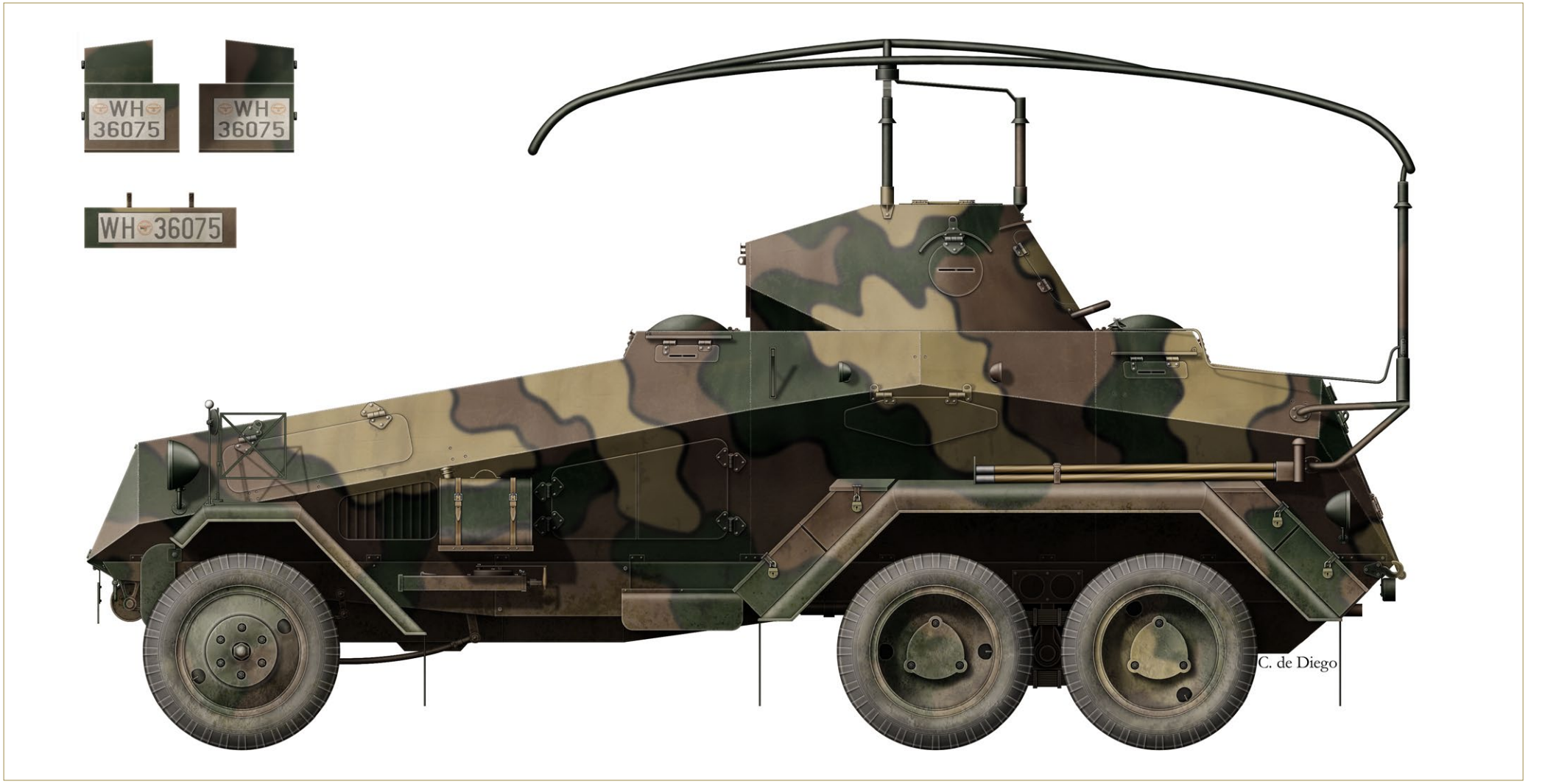
Sd.Kfz. 11, non-identified unit, Germany, 1937

This artillery tractor (medium calibre) with 3-ton capability was named *leichter Zugkraftwagen 3t (Sd.Kfz. 11).* It shows a *Buntfarben Anstrich* scheme. The pattern, which had been specified in the regulations issued in 1933 consisted of *Grün Nr. 28, Braun Nr. 18* and *Erdgelb Nr. 17* blotches. The last hues had also been distributed along the canvases that covered the upper part of the cabin and the loading platform to equally camouflage them. The paint was applied with a gun sprayer tool so the edges of the blotches got blurred. On the left front mudguard, the pennant used during the training exercises is visible. For the whole period, a few units assigned a letter to each vehicle in accordance with its position in the group; these letters were usually painted white in the front part (sometimes in both sides and in the rear part) so probably this halftrack had a letter labelled in the front right mudguard.

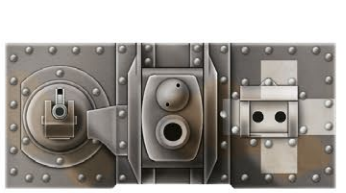


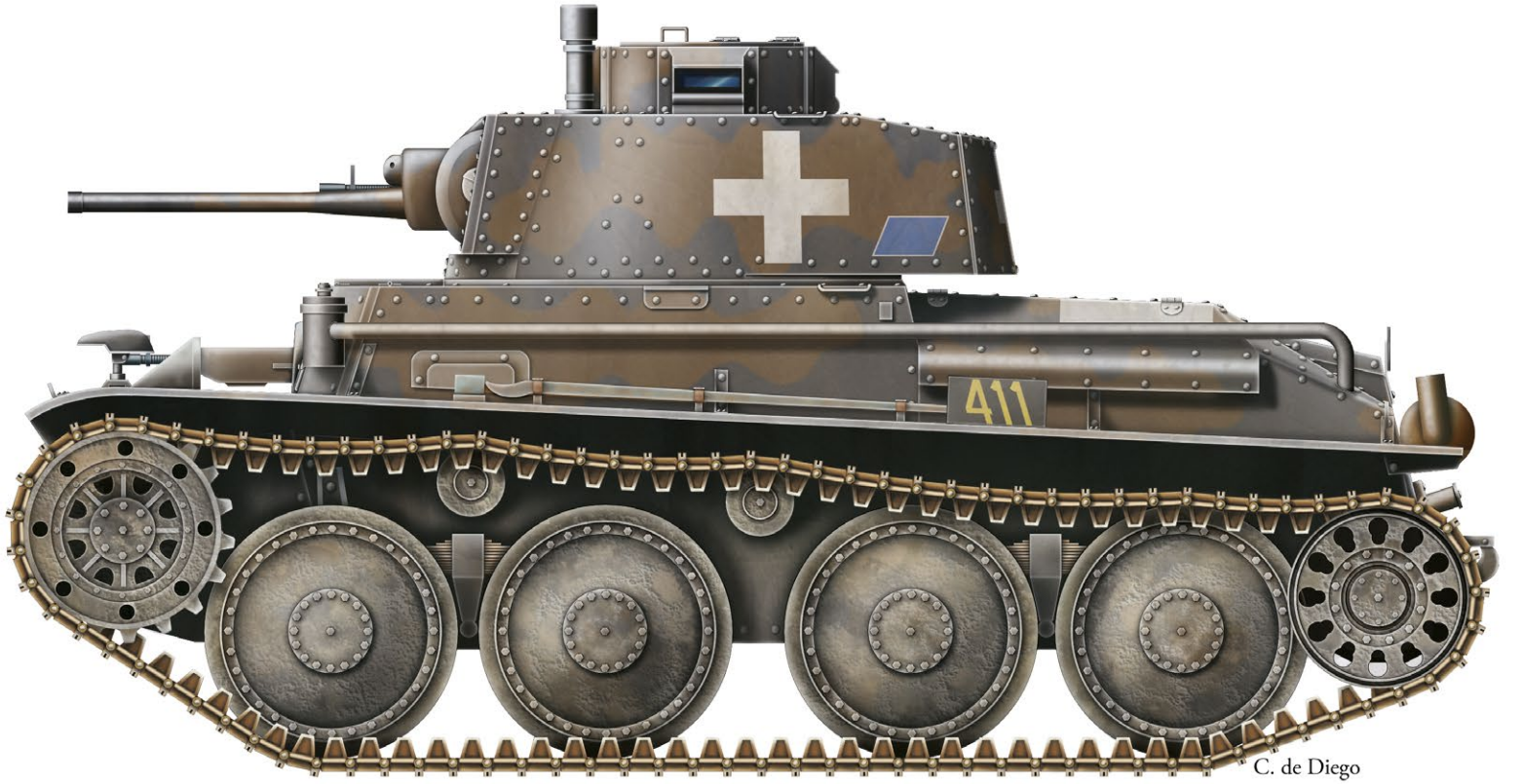
Sd.Kfz. 232 (6-Rad), 2. Pz.Div., Vienna, Austria, March 1938

This was one of the *Heer* armoured vehicles that took active part in the parade which took place after the *Anschluss* (annexation). Austria became a province of the *III Reich* in March 1938. This is a *schwerer Panzerspähwagen (Fu)* or heavy armoured vehicle devoted to reconnaissance and equipped with a radio station. There are no weapons in the turret. Both the 20-mm *KwK 30* gun and the *MG 34* machine-gun had been disassembled before the parade in order to emphasize the pacific character of the event. The vehicle had been painted a *Buntfarben Anstrich* camouflage (that is before the 1937 regulations) made up of *Grün Nr. 28, Braun Nr. 18* and *Erdgelb Nr. 17* blotches which had been outlined with thin *Schwarz Nr. 5* lines made with a gun sprayer. The vehicle had no markings or emblems only the *Heer* registration number "WH-36075" under the radiator grille and in the rear mudguards. Some red circular markings can be appreciated in the registration plates: it was the *Feldpostnummer* or the number of the post office given to every unit.



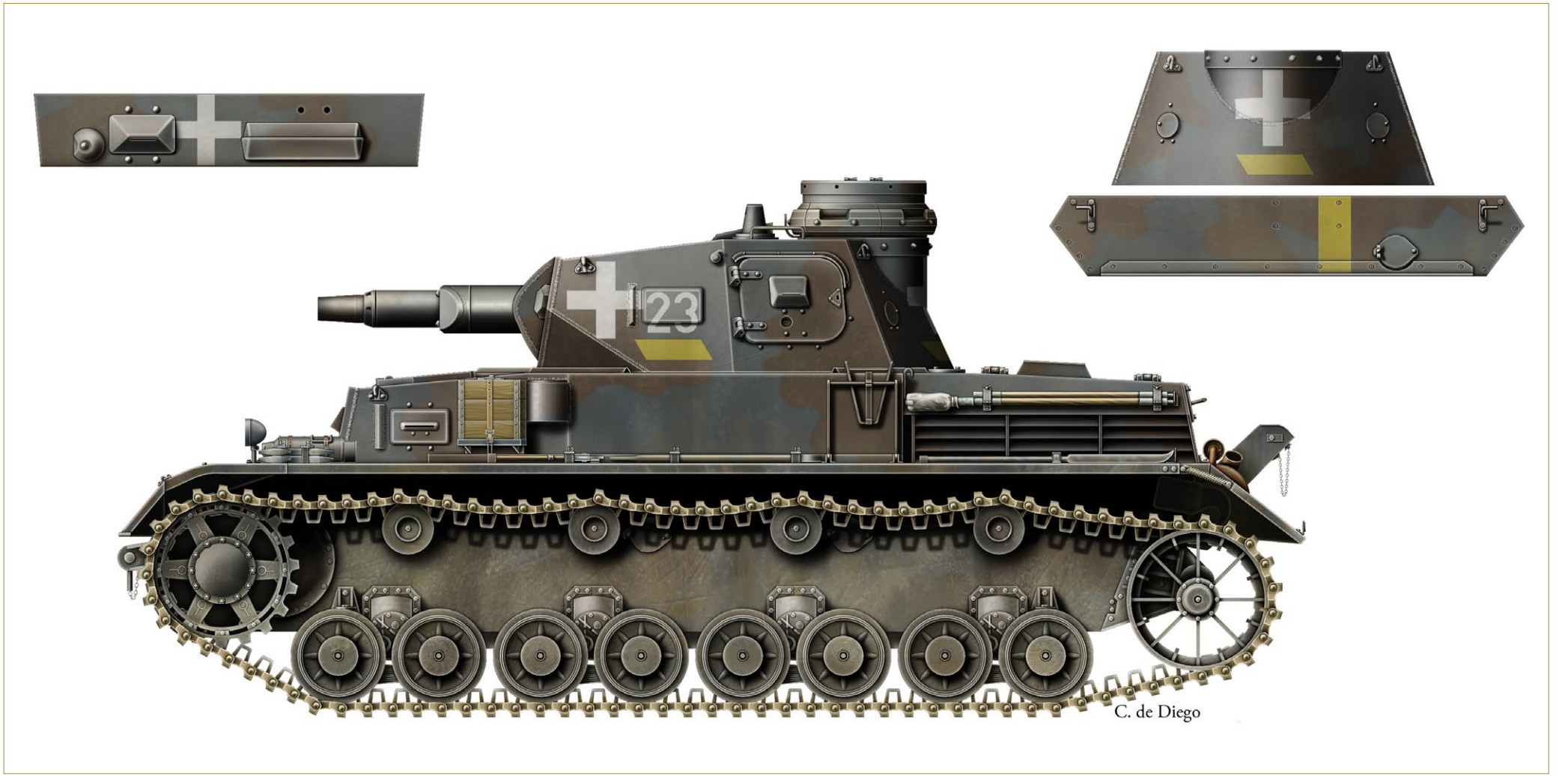
Pz.Kpfw. 38(t) Ausf. A, non-identified unit, Poland, September 1939





On 13th July 1939 the *Inspektorate 6* (Inspectorate for armoured and motorised units) ordered that a white *Balkenkreuz* was painted in the four sides of all kind of armoured German vehicles. As far as the tanks and the command tanks were concerned a white rectangle had also to be added on the rear engine deck for these to be identified by the aviators. During the Polish campaign it became evident that the white crosses were too eye-catching and therefore attracted the fire of enemy's antitank guns so many crews repainted them yellow, *Dunkelgrau* or covered them with a coat of mud.
This *Panzer 38(t)* camouflaged in *Dunkelgrau* and *Dunkelbraun* was attached to a *Pz.Abt.*, in one of four *leichte Divisionen.* The tactical number, painted in the screwed plates in both sides and the rear part of the hull, showed that it was the first tank of the first section of the four company (to be read from right to left). In both sides of the turret the tactical marking of the armoured unit is outlined, a *"Panzerraute"* (schematic drawing of a tank) with the company colour inside. Historically, in *Heer,* 1st and 5th Companies were given the white shade, 2nd and 6th were given red, 3rd and 7th were given yellow and blue was meant for both 4th and 8th companies. It is odd: the *"Panzerraute"* is in an inverted position in the left side.

Pz.Kpfw. IV Ausf. B (Vs.Kfz. 622), 5. Pz.Div., Opatow, Poland, September 1939



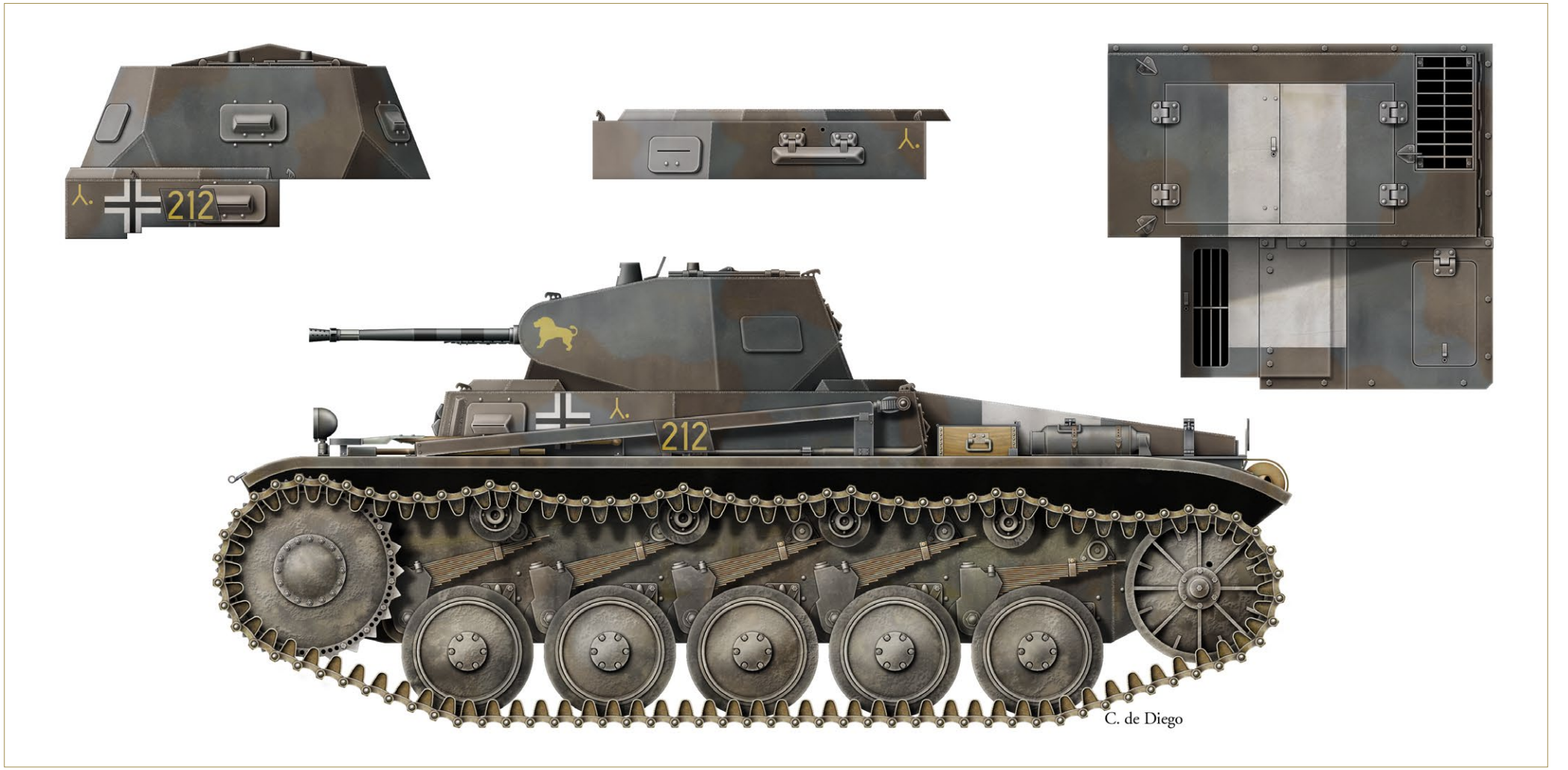
The quantity of available *Panzer IV* operating in Poland was so scarce that each armoured brigade could only rely on twenty-four vehicles, twelve in every regiment. These were split in two sections of three tanks each in every battalion of these two ones attached to each regiment. This vehicle belonged to *5. Pz.Div.*, one of the few armoured groups that used specific marks during the campaign. Its tanks had some yellow rhomboids painted in the turret, sometimes crossed by a black centred line coming from top to bottom, to make a distinction between *Pz.Rgt. 15* and *Pz.Rgt. 31*. In the illustration: yellow markings in both sides and the rear part of the turret plus a vertical yellow line in upper rear part of the hull. The white crosses are placed between the visors in the front hull and in the sides and the rear part of the turret; these were some sort of national emblem. The rear engine deck of the tank has not been pictured as in that particular period, not all the armoured vehicles had a white rectangle for air identification painted there.

Pz.Kpfw. II Ausf. C (Sd.Kfz. 121), Pz.Rgt. 15, 5. Pz.Div., Germany, early 1940

After the Polish experience, on 26th October a new order issued from the *In 6* forced the erasing of the front cross in all armoured vehicles. On the other hand, the design of the *Balkenkreuz* varied: the centre had to be open like the ones in the *Luftwaffe* airplanes and be made up of four white stripes, L-shaped, about 2.5-cm wide. These 25-cm crosses (in each side) should be painted in the sides and in the rear superstructure of the hull (so not in the turret).

On 1st November 1939, the *In 6* issued a new Ordinance, this time referred to identification symbols for *Panzerdivisionen.* These would be immediately outlined using *Gelb* (yellow, later named *Gelb RAL 1006*) in all motor vehicles, including armoured ones of this kind of units. No bigger than 10x10-cm. Along with these specifications there were a list of markings used to identify every *Pz.Div.*

The *Panzer II* in the illustration camouflaged with *Dunkelgrau Nr. 46* and *Dunkelbraun Nr. 45,* had been added the *5. Pz.Div.* emblem in four sides; it was a Y-shaped inversed rune followed by a dot. There was also a lion in the sides of the turret; this could match a *Pz.Rgt. 15.* unofficial emblem. After the campaign in the West this regiment was the nucleus to form the new *11. Pz.Div.*

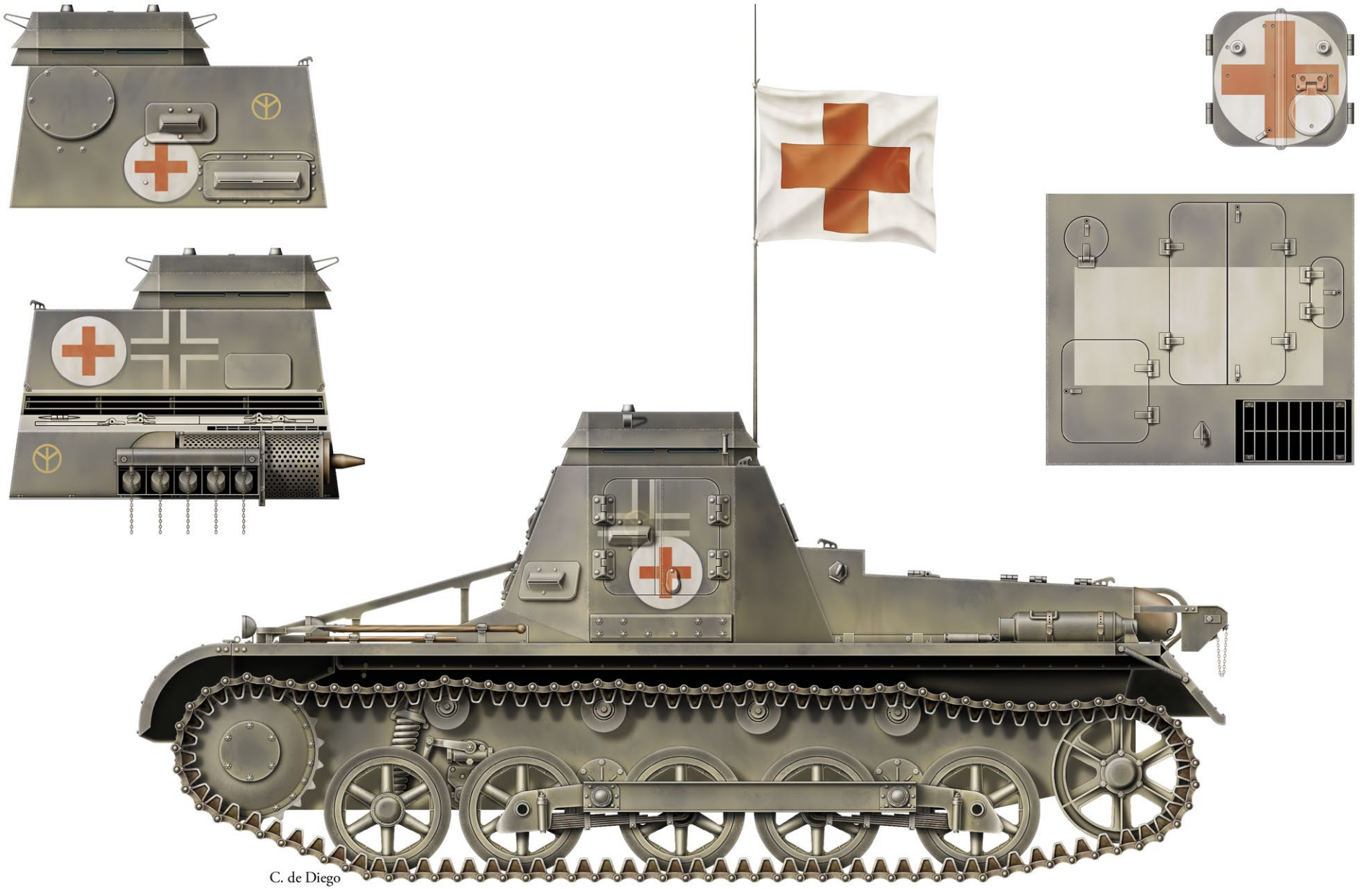


Pz.Kpfw. I Ausf. B (Sd.Kfz. 101), 7. Pz.Div., Sivry, Belgium, May 1940

On these lines. This *Panzer I Ausf. B* had been painted *Dunkelgrau* and *Dunkelbraun.* A bright yellow canvas had been tied to the rear deck. The *Balkenkreuze,* with their own centre filled with black (for reducing their visibility) appear in the sides and the rear part of the hull while, in four sides, there is a yellow inverted-Y rune followed by three dots which served as 7. *Panzerdivision* emblem. The red numbers are labelled in the sides of the turret: they have been added some white rim in order to ease identification.

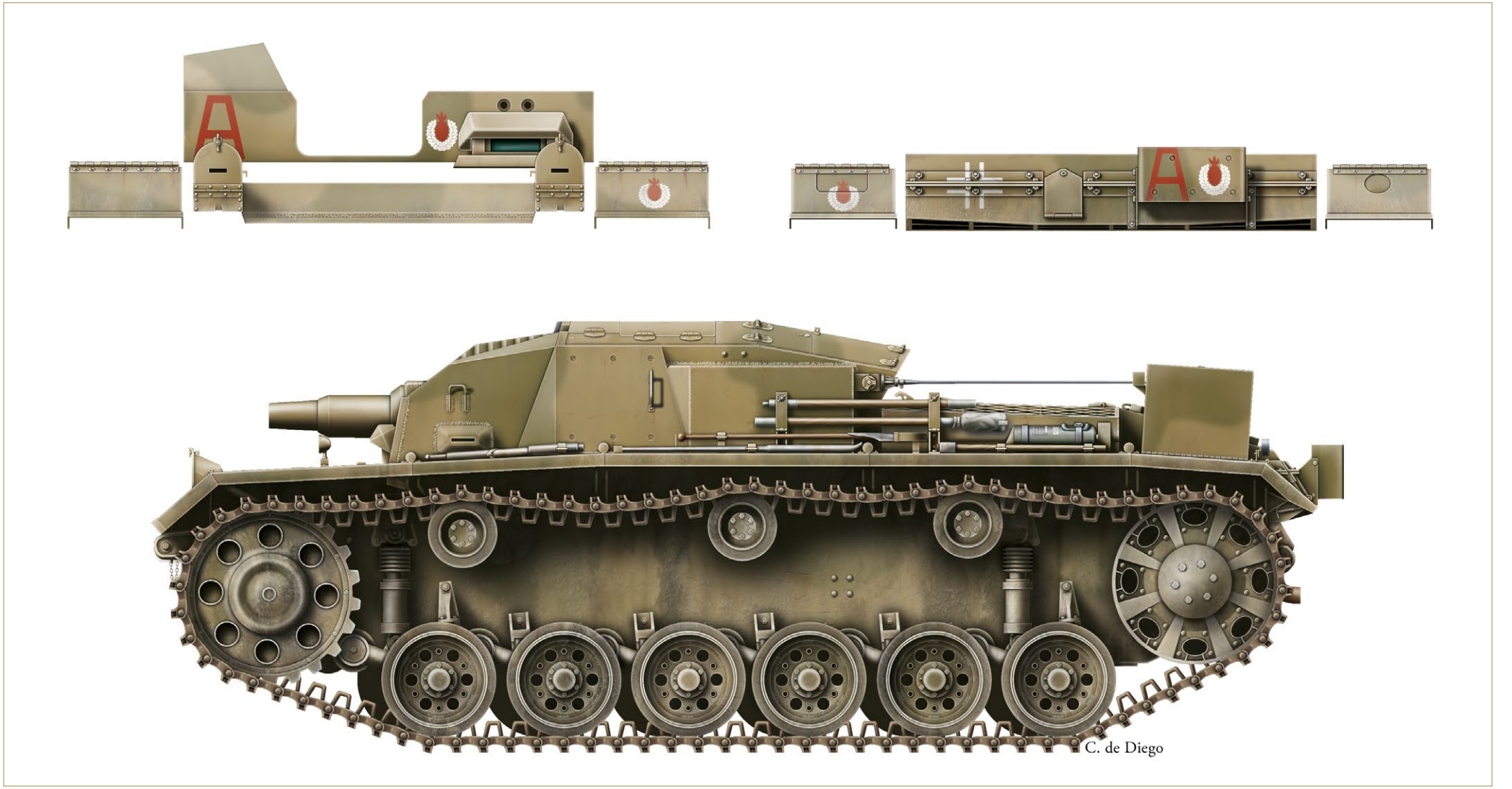
In the following page. In 1940 the *kleiner Panzerbefehlswagen I Ausf. B* was a small command tank based on the *Panzer I Ausf. B* which had become outdated. This vehicle in particular had been turned into an ambulance tank to be exclusively used by a medical officer appointed at *Pz.Rgt. 35* or *Pz.Rgt. 36*, the two *Panzerregimenter* in the *4. Panzerdivision* at that time. The unit emblem is visible in four sides; the vehicle had no weapons. There are many red crosses inside white circles, these drawings had been added even onto the old *Balkenkreuze* in the sides of the casemate. Besides, there is a white rectangle for air identification on the engine deck.

Sanitätspanzer (Sd.Kfz. 265), 4. Pz.Div., France, May 1940

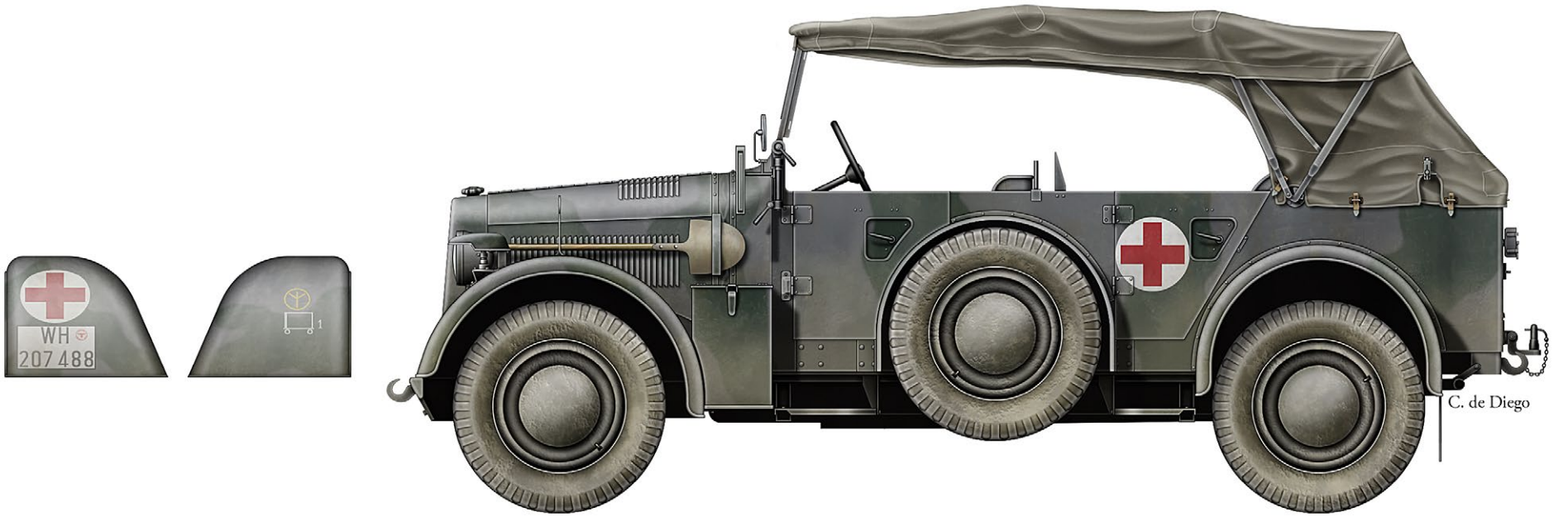


StuG. III Ausf. B (Sd.Kfz. 142), Artillerie-Lehr-Regiment, Jüterbog, Germany, 1941-1942

The *Sturmgeschütz III Ausf. B* built by the firm Alkett with chassis number *Fgst. Nr. 90111*, was pictured in Jüterbog, in the premises of the *Artillerie-Lehr-Regiment* (Regiment made up of training and demonstrating units) showing a "tropical" camouflage pattern. This was made up of clouds painted *Graugrün RAL 7008* gun sprayed onto a general *Gelbbraun RAL 8000* layer in accordance with the regulations *H.M. 41, Nr. 281.* The emblem of the unit was a bombard (old bomb) surrounded by some oak leaves. This hallmark outlined using red and white can be found in the front left mudguard and in the front plate of the casemate, close to the driver's *Fahrersehklappe.* In the same plate but in the right corner, notice a big A-lettering that showed it was the first assault gun in this battery. The illustration includes a detail in the rear part of the vehicle; it is a sort of interpretation on the way the hallmarks should have been placed in that area.

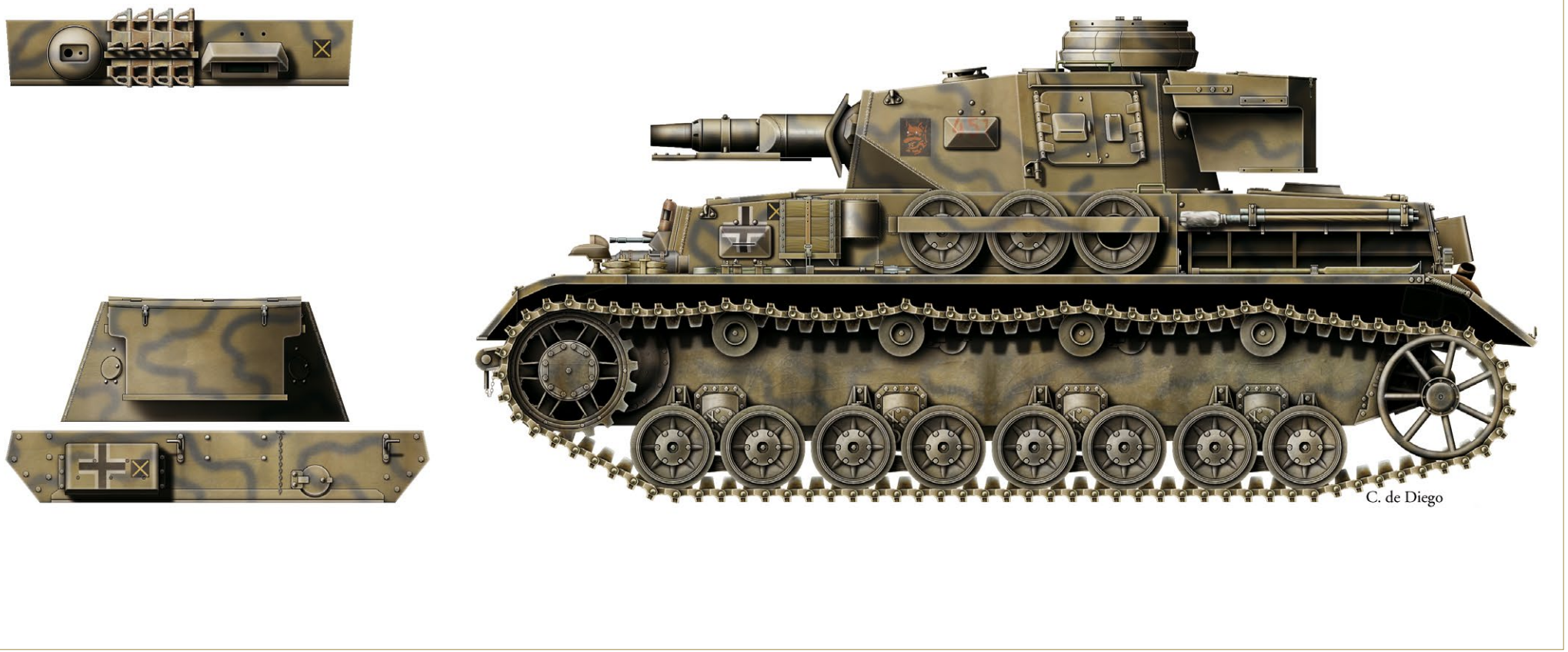


Horch Kfz. 15, 4. Pz.Div., Ukraine, June 1941



This medium off-road passenger car has been assigned to one of the medical officers that were on duty in *Schützenregiment 12* or *Schützenregiment 33,* both rifle regiments and both motorised ones (motorised infantry) and which were a part of *4. Panzerdivision.* The emblem of the division used by 1940 is visible in the right front mudguard painted *Gelb RAL 1006* (it appeared in some vehicles even in 1941 and would be in use again during the 1944-45 period). Under the emblem there is a generic tactical marking for motorised infantry units painted *Weiss RAL 9001* followed by a number "1" that matched the first company. These hallmarks are repeated in the rear part of the vehicle. The registration plates (painted in the front right mudguard and in the left side of the hatchback or rear door) had the lettering "WH" labelled in black and are followed by six figures (the lettering matching *Wehrmacht* and *Heer*). As usual, the figures are reunited in two groups of three digits each with a blank space for these to be easily read. The *Feldpostnummer* is inside the registration plate printed red. The Red Cross hallmarks painted *Weiss RAL 9001* and *Rot RAL 3000* (red) are placed close to the registration plates, in the side rear doors (in some similar vehicles these could appear in the front doors and probably in the hood canopy too). The camouflage is made up of winding bands painted *Grün RAL 6007,* gun sprayed onto the original *Dunkelgrau RAL 7021* applied in the factory. Using the gun sprayer makes the colour transition much smoother and the edges of the blotches can be blurred. The *Grün* colour was not in use any more by November 1938 but could be employed to draw camouflage blots in some vehicles and tanks which took active part in *Marita* Operation by April 1941 (the invasion of the Balkans and Greece) and in *Barbarossa* Operation in June. The hue was in use until the end of the War.

Pz.Kpfw. IV Ausf. F (Sd.Kfz. 161), Pz.Rgt. 31, 5. Pz.Div., Ukraine, March 1942

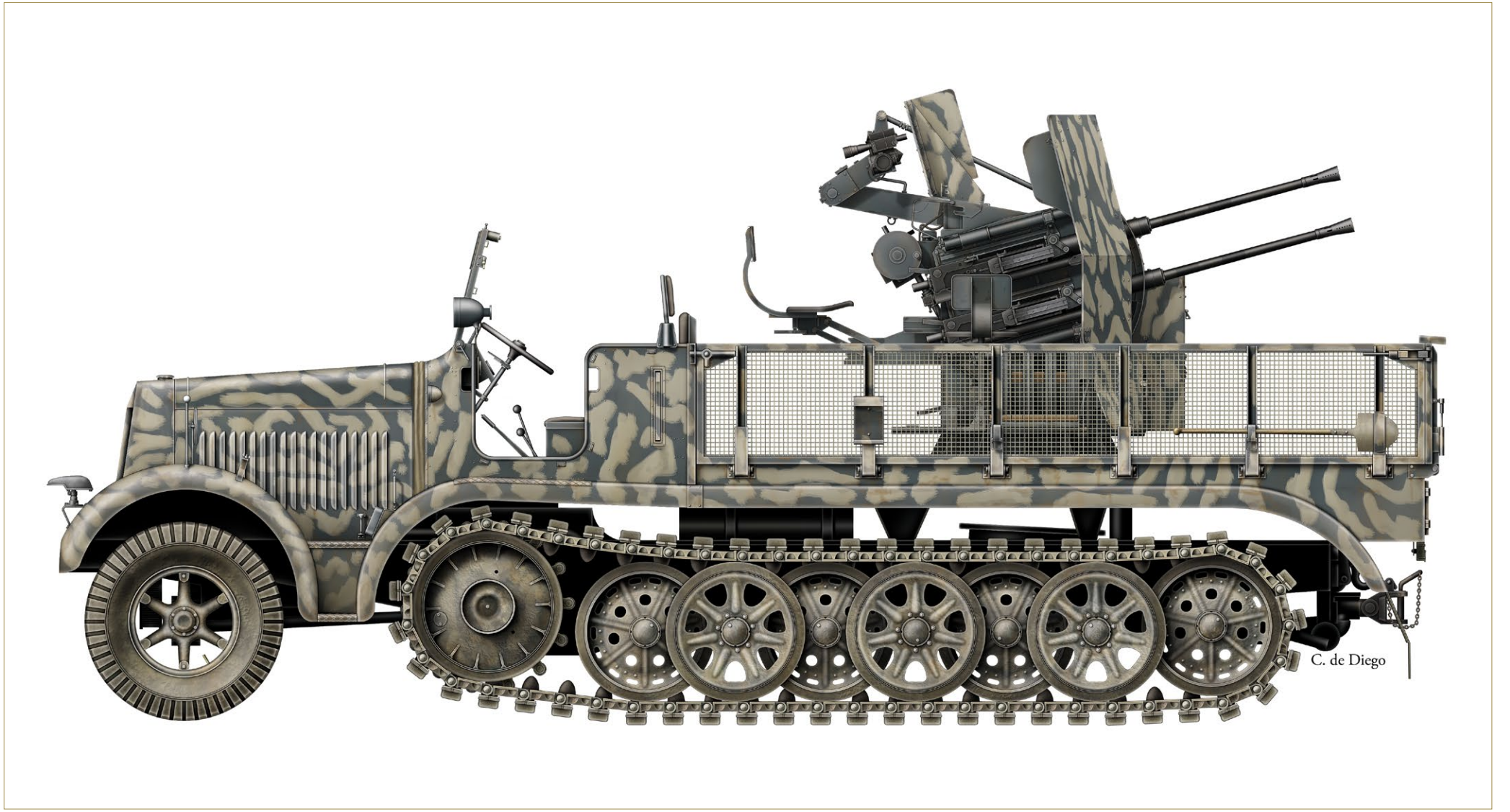


This *Panzer IV Ausf. F* exited the factory painted *Gelbbraun RAL 8000*, it was attached to *Panzerregiment 31* and was camouflaged with a gun sprayer (along with some other vehicles) by adding thin irregular lines using *Dunkelgrau RAL 7021*. In the right side of the upper structure of the hull, just above the aerial protective wooden trough or channel, it had been added some black *Fahrgestell-nummer* (chassis number) *82273*, whose figures are up to 4-cm high.

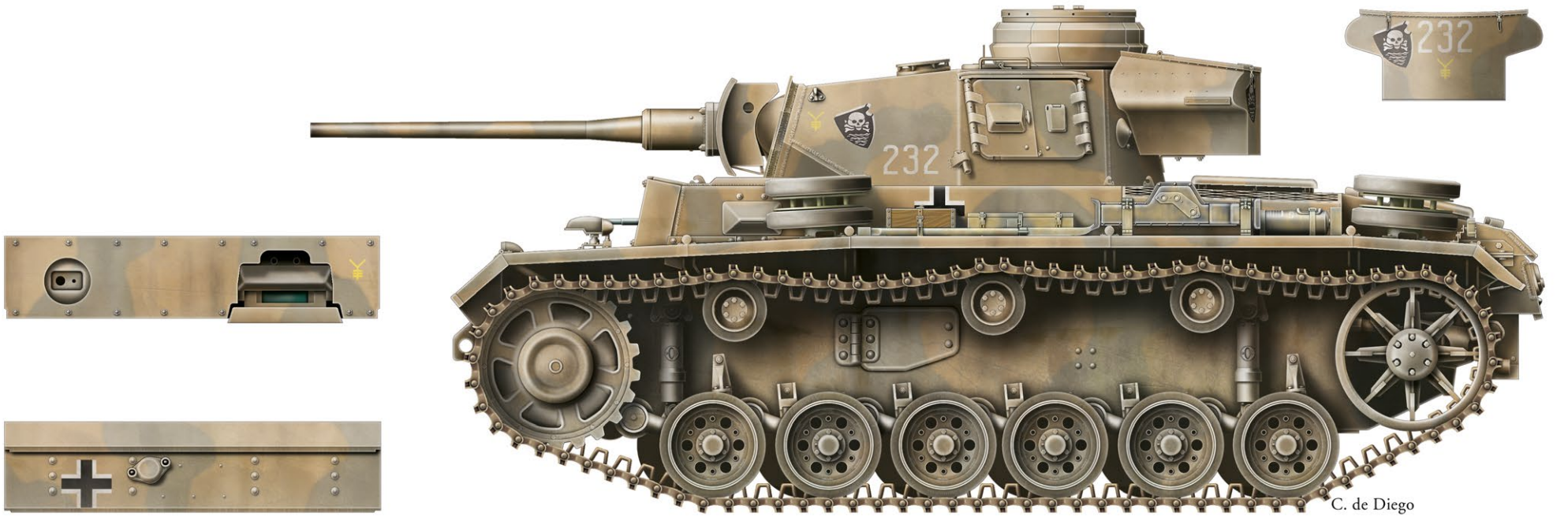
The aforementioned armoured regiment had a complicated insignia named *"Rot Teufel"* (red devil), drawn inside a black or grey rectangle placed in the avant-garde of the turrets sides. The new insignia adopted in 1941 by *5. Panzerdivision*, a yellow "X" interchangeably painted onto a black or a red background, can be seen in the front, the sides and the rear part of the hull. Next to some division emblems appearing in the sides and the rear part there is a *Balkenkreuz* with its inner part filled with black paint. Finally, the tactical number is labelled only in both sides of the turret, on the visors' covers using red to make a tiny drawing. In this case "451", to be read from the right to the left, meant the first tank, fifth section, fourth company.

Sd.Kfz.7/1, Heer non-identified unit, Caucasus, summer 1942

In springtime 1942, as it had already happened during the operations that took place in the peninsula of Crimea in 1941, so many vehicles painted *Dunkelgrau* were camouflaged using mud. This was a really efficient way to camouflage the vehicles: once the mud dried the shade mimicked so efficiently the colours in the environment. By the summer 1942, a few units took active part in the *"Fall Blau"* Operation with their own vehicles covered with mud layers: the mud had been applied with a big flat paintbrush or with some different brushes or simply with the fingers. Note the medium 8-ton tractor equipped with a 20-mm quad anti-aircraft gun or *mittlerer Zugkraftwagen 8t mit 2cm Flakvierling*.



Pz.Kpfw. III Ausf. L (Sd.Kfz. 141/1), Pz.Abt. 18, 18. Pz.Div., Orel, Russia, January 1943



When the *18. Pz.Div.* was formed in October 1940 it was at first equipped with *Tauchpanzer* (diving tanks) for the foreseen although never come true invasion of Great Britain. That's why *Pz.Rgt. 18* adopted an insignia made up of a shield with the characteristic *Panzertruppen* skull but placed onto winding lines that depicted the water in the English Channel. When the unit was delivered the usual tanks this emblem was still in use.

The illustration is based on a photograph of a tank destroyed by the Soviets; a *Panzer III Ausf. L* camouflaged with *Braun RAL 8020* and *Grau RAL 7020*. The tactical numbering appearing in the sides of the turret along with the characteristic *Pz.Rgt. 18* insignia and the official insignia of the Division, a Y-shaped rune crossed by three horizontal bars. We need to point out that the *Pz.Rgt. 18* only relied on one *Pz.Abt*. since the spring 1942. The 'wear and tear' is quite visible in the photograph: a part of the running gear, the mudguards, the gun, the commander's cupola are missed along with the *"Rommelkiste"* that should be screwed in the rear part of the turret. This unit tanks had their emblems and their numbering put in the rear part of this stowage bin that's why we have depicted them this way. The position of the *Balkenkreuze* is the standard one, in both sides of the upper half of the hull and in the left rear part. The division emblem is also painted next to the front driver's visor.

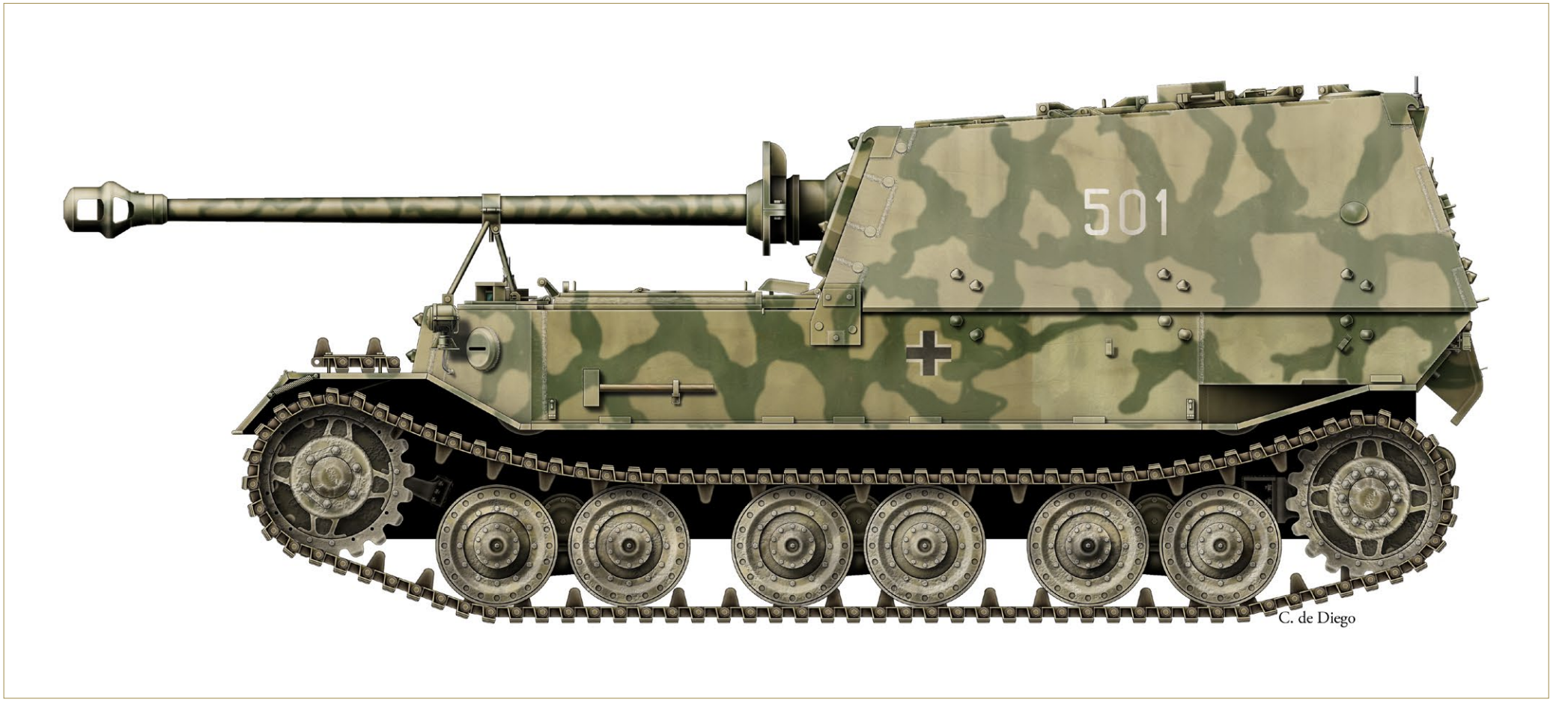
Pz.Kpfw. VI Tiger Ausf. E (Sd.Kfz. 181), schw. Pz.Abt. 504, Djebel Djaffa, Tunisia, April 1943

Just from the Henschel factory, this *Tiger* with series number 250122 was attached, late February 1943, to the *schwere Panzerabteilung 504* (504 heavy tanks battalion) on assignment in Sicilia. It was attached to the first company so the tactical number "131" was labelled in the sides and the rear part of the turret.
Early March this company was sent to Tunisia. On 19th April 1943, during an attack in Djebel Djaffa, to the west of Goubellat where two *Tiger* tanks took active part, the "131" unskilled crew abandoned the tank after the shooting from a British *Churchill* (with no consequences at all). The illustration depicted the armoured vehicle before the event, defying the regulations in vigour; just as some other *Tiger* it exited the factory painted *Gelbbraun RAL 8000* and *Graugrün RAL 7008*. In the front part and in the sides of the hull the tactical marking of the heavy armoured unit is visible with the number matching the first company while there is a cross in the centre of each side. These hallmarks did not appear in the bow or in the stern.
This was caught intact by the British troops and nowadays it is shown in display in Bovington's Tank Museum (UK).

Panzerjäger Tiger (P) Ferdinand (Sd.Kfz. 184), schw. Pz.Jäg.Abt. 654, Kursk, Russia, July 1943

The *schwere Panzerjägerabteilung 654* (654 Battalion of heavy tank destroyers) in short *schw. Pz.Jäg.Abt. 654,* along with the *schw. Pz.Jäg.Abt. 653,* were respectively the *II. Abt*. and the *I. Abt*. from *schwere Panzerjägerregiment 656* (656 heavy tank destroyers Regiment) a unit formed to test in combat the *Ferdinand* tank destroyers designed by Porsche. This big tank destroyers exited the factory finished in *Dunkelgelb* paint, with their *Balkenkreuze* painted in the sides and in the rear central part of the hull.

The forty-four *Ferdinand* attached to *schw. Pz.Jäg.Abt. 654* were camouflaged with a gun sprayer using either *Grün RAL 6007* or *Olivgrün RAL 6003*, following a pattern of winding lines that interlaced creating a sort of net. The emblem of the battalion during "*Zitadelle"* Operation was a capital "N" (after the family name of the commander, the *Hauptmann* Noak). This emblem was usually painted white in the front left mudguard and in the rear part of the casemate, in the left corner. The lettering was followed by the abbreviation, in lowercase, "st", if the tank destroyer was a part of the *Stab* (Staff) or a number from one to three depending on the company. Considering the regiment organization chart, the three companies were respectively numbered *5. Kp., 6. Kp*. and *7. Kp*., so the tactical number "501" matched the first command *Ferdinand* of *5. Kp*. The numbering is labelled in the sides of the casemate and on the circular hatch placed in the rear, while the *Balkenkreuze* are just painted in the sides of the hull.

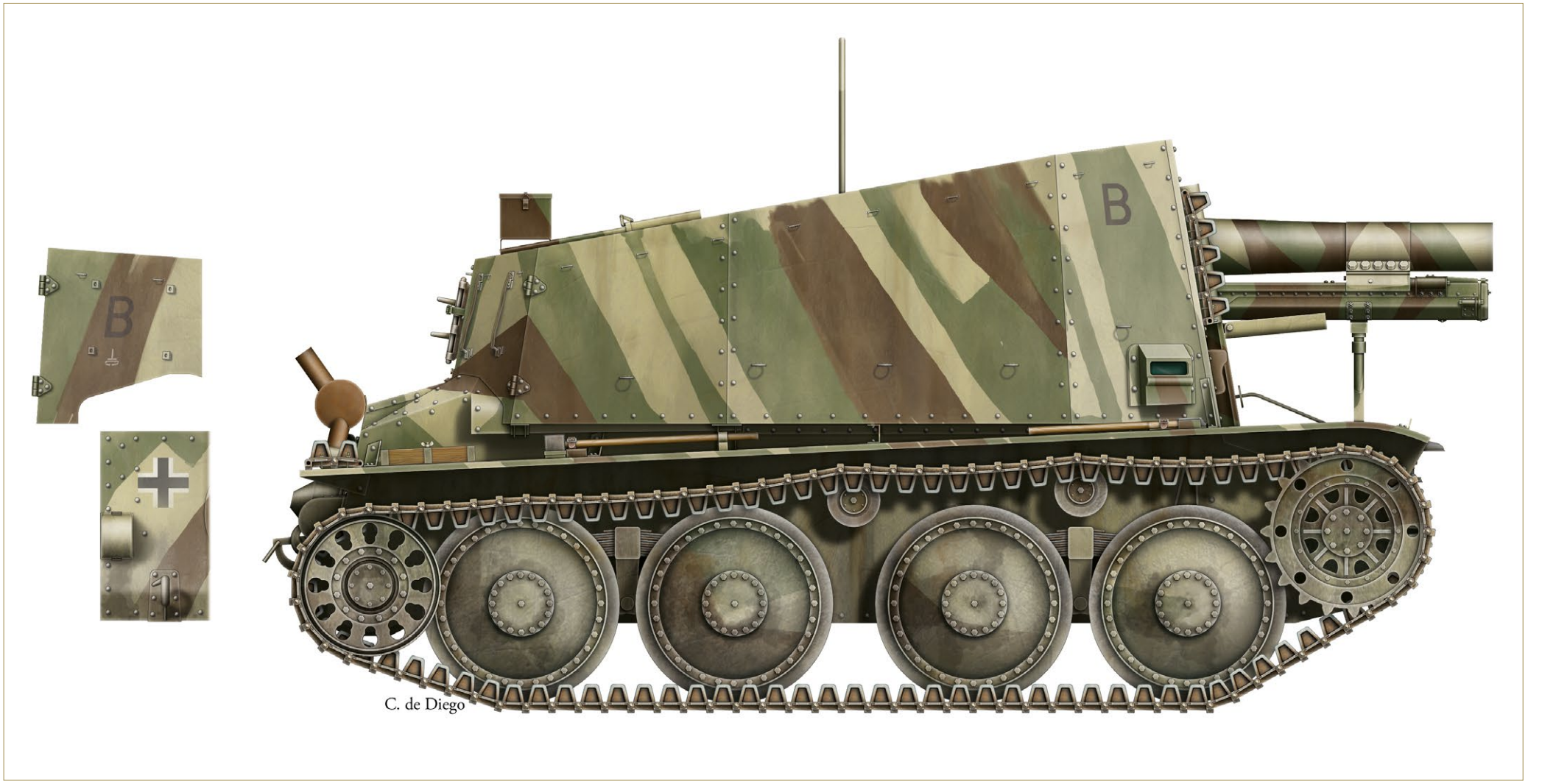


Pz.Kpfw. IV Ausf. H (Sd.Kfz. 161/2), Pz.Rgt. 3, 2. Pz.Div., Picardy, France, March 1944

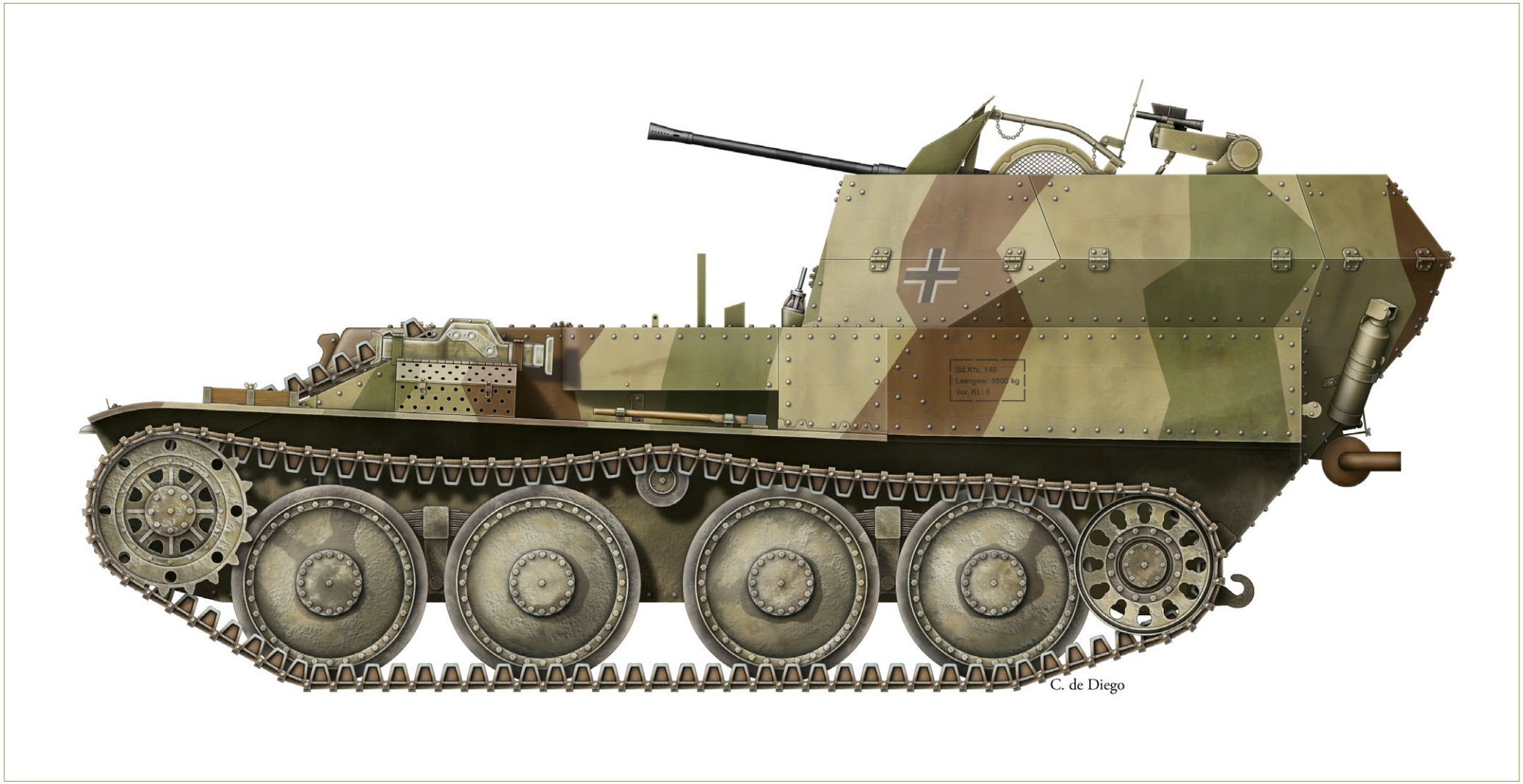
After enduring severe losses in the central sector of Dnieper in January 1944, the *2. Panzerdivision* was sent from the eastern Front to the Somme in France. There, the crew could have some rest, the losses were covered and it was equipped with some new material. The new *Panzer IV* delivered had the *Fahrgestellnummer* painted white with a stencil: it was made up of five figures and appeared next to the hull machine-gun. All these vehicles were camouflaged with a gun sprayer and added *Rotbraun* and *Olivgrün* or *Grün* blotches. This was a motley pattern that partially hid the *Balkenkreuze*, (probably in purpose). The illustration depicted a tank with tactical number “825”, in both sides and in the rear part of the turret protective shield. The original colour of the gun’s barrel was *Dunkelgrau* and was covered with *Rotbraun* and *Olivgrün* or *Grün* blotches. Like the rest of these *Panzer IV* in the regiment, the *Schürzen* (side skirts) are numbered and marked with some “L” or “R” lettering depending on the side (*Rechte* is for right, *Linke* is for left).

Grille Ausf. H (Sd.Kfz. 138/1), non-identified unit, Normandy, France, June 1944

This 150-mm self-propelled howitzer named *15cm sIG33/1 (Sf) auf GW 38(t) "Grille" (Sd.Kfz. 138/1) Ausf. H,* had a rare camouflage pattern: some big diagonal bands painted *Olivgrün RAL 6003* and *Rotbraun RAL 8017* that crossed the walls of the casemate from top to bottom. In the side armour the B-lettering is visible and allows to identify it as the second one in the battery. This lettering was repeated probably in the other side and in the rear part. There is a small tactical symbol below featuring a self-propelled howitzer. The letters were supposed to be painted the colour matching the battery although, in this case (and quite often) the letter had been painted black and gave no information related to any battery. The *Balkenkreuze* in both sides are hidden by these camouflage bands while the left rear part had not been covered. The illustration is based in a photograph taken by the British in Saint-Lambert-sur-Dives, Low Normandy, in the summer 1944.

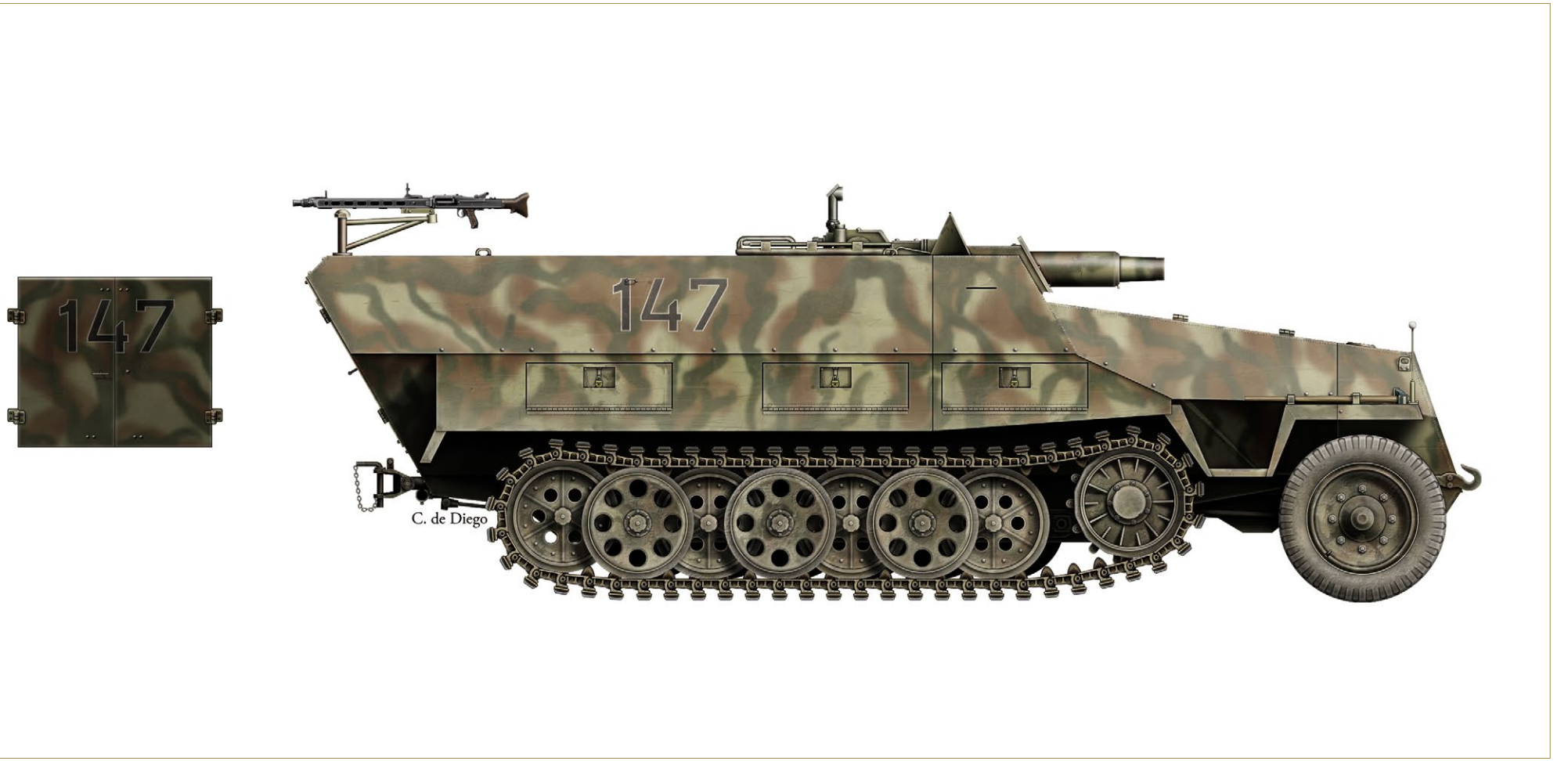


Flakpanzer 38(t) Guepard (Sd.Kfz. 140), 21. Pz.Div., Normandy, France, June 1944



Along with other *Afrikakorps* units, *21. Panzerdivision* was destroyed in Tunisia in May 1943. During the summer 1944, a new armoured division was formed with personnel from different occupation units, it was given number 21. This new *21. Panzerdivision* was basically equipped with old French armoured vehicles (most turned into self-propelled guns) although it was subsequently delivered some other material such this antiaircraft *2cm Flak 38 auf Selbstfahrlafette Pz.Kpfw. 38(t) Ausf. M (Sd.Kfz. 140)*, also known as *"Guepard"*. The armoured vehicles of this unit were added a scheme that recalled the geometric shapes that can be found in a *Zeltbahn* (soldier's poncho fabric). It was made up of *Olivgrün* splintered blotches or using *Olivgrün* and *Rotbraun.* The blots were painted with a paintbrush onto a general layer of *Dunkelgelb*. In August 1944, that division was virtually annihilated during the Battle of the Falaise Pocket.

Kanonenwagen Sd.Kfz. 251/9 "Stummel" Ausf. D, 5. SS-Pz.Div. "Wiking", Poland, August 1944



This halftrack equipped with a 75-mm *Kampfwagenkanone 51 (Sfl)* was attached to the *1. Kompanie, I. Abteilung, SS-Pz.Gren.Rgt. 9 "Germania",* belonging to *5. SS-Pz. Div. "Wiking".* The illustration is based in a few photographs taken during the summer 1944 while the unit was having a rest or was training in the Heidelager industrial site, in Debrica, southern Poland, after the fierce combats in Ukraine. The camouflage blotches were made up of meandering long lines of *Olivgrün RAL 6003* and *Rotbraun RAL 8017,* whose width is not homogeneous. These colours were gun sprayed onto the standard *Dunkelgelb RAL 7028* applied in the factory; these were well-defined but the edges seem a bit blurred. Another halftrack in this very unit had some outlining added to the division emblem in the front and the rear parts. This was a rune depicting a Sun disc named *"Sonnenrad"* (a circular *Swastika*), and the tactical marking of the armoured grenadiers, both painted white. Nevertheless, this vehicle hasn't got any of those emblems (perhaps the photograph was taken before they were painted). There are no registration numbers or national insignias (*Balkenkreuze*) painted. The tactical numbers are labelled in the sides and the rear part of the combat chamber. The numbers, recalling the ones painted in the tanks, are "147", black numbers with white outlining (to be read from the right to the left) showing that the vehicle was attached to the fourth section and the first company.

Pz.Kpfw. VI Tiger Ausf. B (Sd.Kfz. 182), schw. Pz.Abt. 509, Sennelager, Germany, September 1944

On 8th September 1944, the *schwere Panzerabteilung 509* quit the Eastern Front and moved to Sennelager, in Padernborn, to be re-equipped with *Tiger Ausf. B* tanks also known as *Tiger II*. It was merely delivered 11 tanks that allowed the crews, for the rest of this month and the following one, to get trained and to get used to these new armoured tanks. Early December 1944, these heavy tanks would be transferred to *schwere SS-Panzerabteilung 501*.

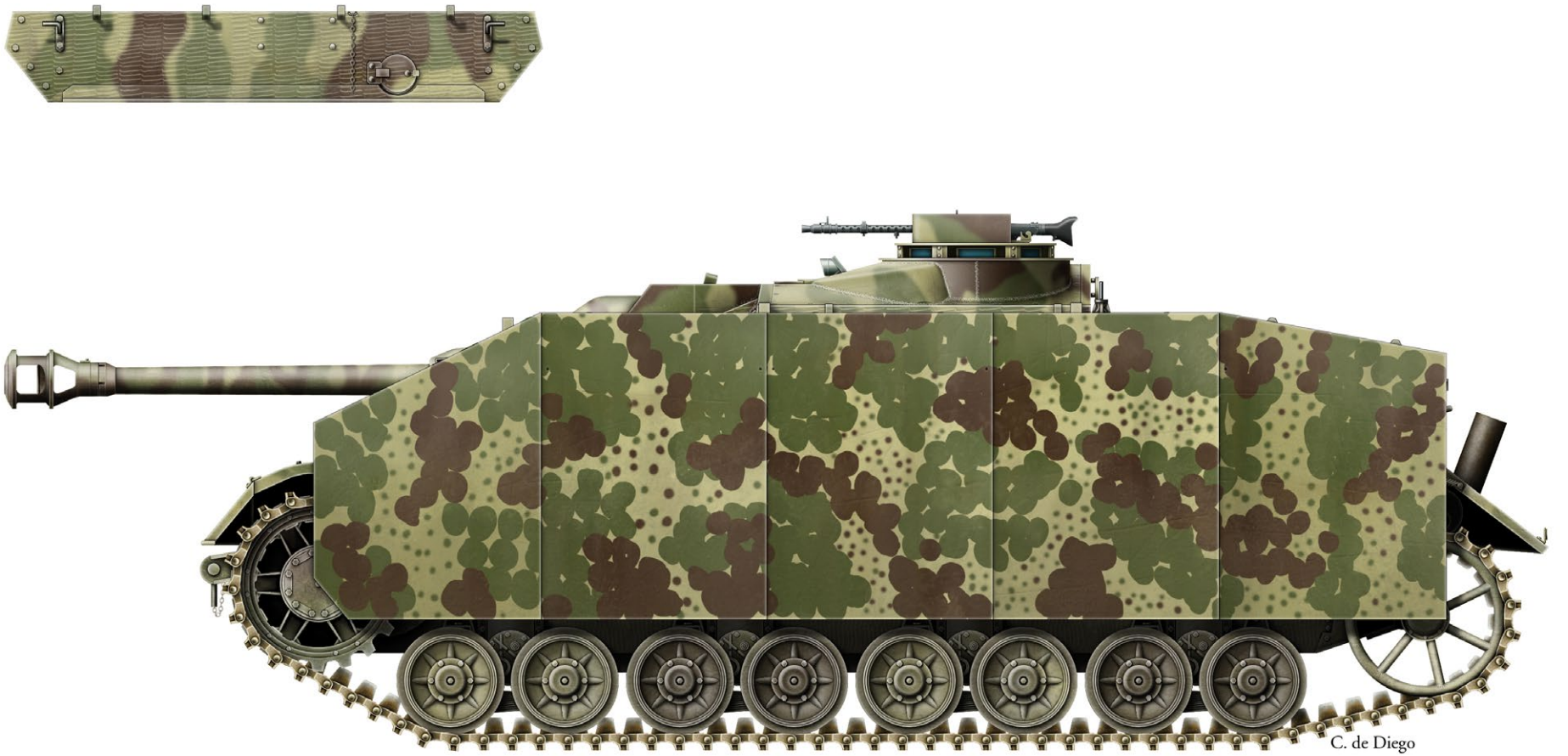
The illustration shows one of those *Tiger Ausf. B* with a standard camouflage (designed to be used from the late summer to the early autumn). This scheme has been known after the war as *"Ambush"* or *"Hinterhalt"*. This pattern was intended to hide the tank shape among the forest and the trees: the "*chiaroscuro*" effect of the leaves with the sun rays passing through and creating shadows was perfectly mimicked. Due to the lack of paint, during this period, the armour was not applied a general coat of *Dunkelgelb RAL 7028* and then blotches of *Olivgrün RAL 6003* and *Rotbraun RAL 8017* (complementary shades) and the motley pattern at the end. At first, a series of *Dunkelgelb* blotches, then new ones with *Olivgrün* and *Rotbraun* in the free surface, so any colour should cover just its own space not hiding the other ones. The motley pattern was added at the end. To use as less paint as possible, very often, the men just painted *Dunkelgelb RAL 7028* and *Olivgrün RAL 6003* blotches while the *Rot RAL 8012* antirust primer was clearly visible. Some dots of *Dunkelgelb* and *Olivgrün* were added at the end. The *Balkenkreuze* were painted as usual in both sides of the turret and in the rear part of the hull.

Opel "Blitz" 3.6-36S (Kfz. 305), 9. SS-Pz.Div. "Hohenstaufen", Arnhem, Holland, September 1944

This truck was one of the vehicles attached to the *SS-Flakabteilung 9 "Hohenstaufen"*, the anti-aircraft battalion of *SS "Hohenstaufen"* division. It had been painted a dark camouflage scheme made up of *Rotbraun RAL 8017* and *Olivgrün RAL 6003* blotches which proved to be highly adequate in all those areas with thick and lush vegetation. The brown smudges were the first ones, the edges were drawn with a gun sprayer and then the inner part was filled. Acting the same way the free space between the blotches was painted green. This was an industrious careful work as the standard out-of-the-factory *Dunkelgelb RAL 7028* had to be visible. As this is a light shade, the edges of the other hues stood out. Unfortunately, the registration number in the photograph is quite blurred so we cannot see any numbering.

StuG. IV (Sd.Kfz. 167), Krupp factory, Essen, Germany, September 1944

This late *Sturmgeschütz IV* was probably among the last ones to be applied *Zimmerit*. This anti-magnetic coat was hidden under the five *Schürzen* (armour skirts). The camouflage of the hull and the casemate is made up of extended blotches painted *Rotbraun RAL 8017* and *Olivgrün RAL 6003* and gun sprayed onto the general coat of *Dunkelgelb RAL 7028* (see the detail in the hull's rear plate). Nevertheless, the blots in the *Schürzen* are made up of groups of big dots painted *Rotbraun* and *Olivgrün.* There is a free gap, so the *Dunkelgelb* base has been covered by mottled *RAL 6003* and *RAL 8017.* Notice in the first and the last *Schürzen* a darker *Dunkelgelb* hue. In the rear part there is still no *Balkenkreuz.*



Pz.Kpfw. V Panther Ausf. G (Sd.Kfz. 171), MAN Factory, Germany, December 1944

On these lines. This illustration is based in a photograph taken in the premises of the MAN factory. In the picture there is a *Panther Ausf. G* with chassis number "121306" painted according to *Heeres Waffenamt* specifications, with a scheme designed for springtime and the beginning of the summer. Onto a general layer of *Olivgrün RAL 6003*, some *Rotbraun RAL 8017* big blotches made with a gun sprayer along with some *Dunkelgelb RAL 7028* thin and stretched ones have been added. The overall shade is quite dark.

In the following page. The inner part of both the German tanks and the armoured vehicles with a closed roof was painted a light bright colour in order to alleviate the claustrophobia of any member of the crew in such a reduced space. Named *Elfenbein RAL 1001,* this hue was used to paint the roof and the walls of the combat chamber while the floor and the inner part of the engine compartment was solely painted *Rot RAL 8012* primer.

On the other hand, the interior of the hatches, the traps or any other element that could be opened or that was visible from the outside, was finished with the same shade used in the outer surface of the armour for these parts to go unnoticed. All those pieces enduring 'wear and tear' like the handles of the hatches, the structure of the bulletproof glasses, the dashboard, the driver's pedals, the levers, the seats' chassis, the fuse boxes, the support for the machine-gun, the gun sight and the steering wheels for turning and lifting the gun, were usually painted *Schwarz RAL 9005.* There were variations between diverse manufacturers and sometimes these elements were painted *Elfenbein*. Some other pieces were painted *Feldgrau RAL 6006,* like radio stations, which could also be applied *Dunkelgrau RAL 7021.* On the other hand, the finish of different mechanical elements from the engine or the gearbox was achieved using *Schwarz* or *Marinegrau RAL 7002*, *Grau RAL 7003* and *Hellgrau RAL 7009* primer paints (*Grundierfarbe*).

Panzerkampfwagen IV Ausf. J (Sd.Kfz. 161/2), 1944-1945

Panzer IV L/70 (V) (Sd.Kfz.162/1), non-identified unit, Hungary, February-March 1945

In August 1944, the tanks, the tank-destroyers and the assault guns exited the factories already camouflaged. From September, trying to shorten the delivery times and use as less paint as possible, there was no general layer of *Dunkelgelb RAL 7028* or *Olivgrün RAL 6003* applied but just camouflage blotches directly drawn onto antirust *Rot RAL 8012* coat (this allowed great surfaces of *Rot RAL 8012* to be clearly visible). It also happened that some vehicles like this *Panzer IV L/70 (V)* exited the assembly line exclusively covered with antirust *Rot RAL 8012* paint and were sent to depots to be delivered to combat units. This is a *Panzer IV L/70 (V)* tank from the third series built in November 1944. The camouflage seems quite an *impromptu* work achieved by the crew. It is not intended breaking the silhouette of the tank but merely reducing the contrast of the *Rot* hue in an open field. The scheme is made up of long and winding *Dunkelgelb RAL 7028* paint strokes, painted onto the armour, the wheels and the gun. There is just a *Balkenkreuz* in each side and probably there is another one in the rear left part of the hull.

Pz.Kpfw. V Panther Ausf. G (Sd.Kfz. 171), LVI. Panzerkorps, in the surroundings of Küstrin, Germany, February 1945

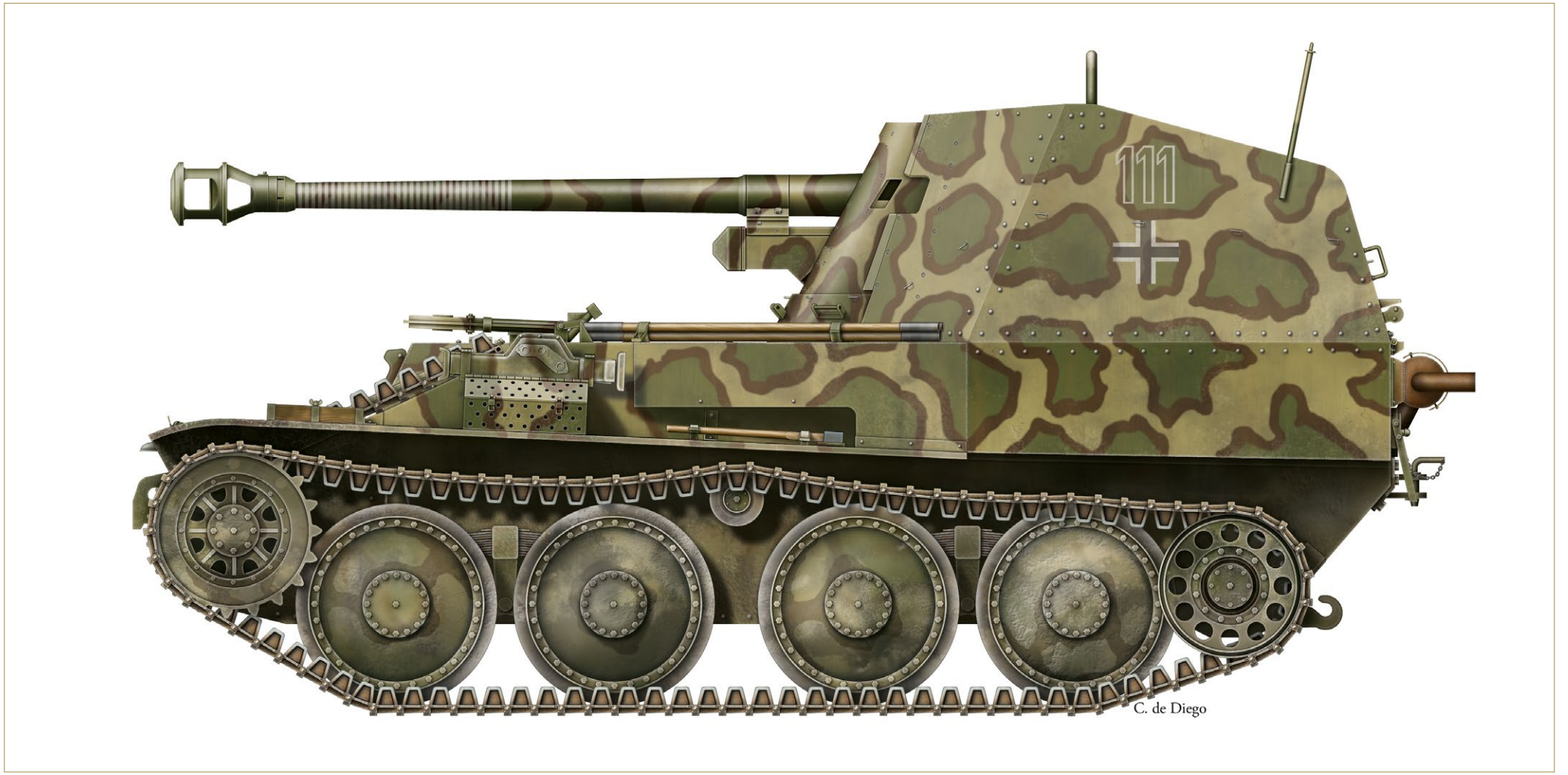
The illustration is based in the well-known photograph of a column of late *Panther Ausf. G*. The camouflage had been gun sprayed in the factory and was made up of *Rot* large *RAL 8012* and *Olivgrün RAL 6003* diagonal bands and thin lines of *Dunkelgelb RAL 7028.* The *Olivgrün* hue had been applied allowing the *Rot* primer to be visible in the sloped and vertical armour surfaces. The horizontal surfaces like the roof of the turret or the upper part of the hull were completely covered with *Olivgrün*. The third colour, *Dunkelgelb,* was applied to outline the bands. The only marking in these *Panther* was a *Balkenkreuz* placed in the rear part of the hull, particularly in the left stowage box.
It is really difficult to figure out the unit these tanks were attached to. Some publications refer to *Pz.Gren.Div. "Kurmark",* some others choose the *LVI. Panzerkorps* (armoured corps) integrating *Pz.Div. "Müncheberg", 20. Pz.Gren.Div.* and *25. Pz.Gren. Div.*

Sd.Kfz. 234/4, Pz.Div. "FHH", Czechoslovakia, May 1945

This *schwerer Panzerspähwagen (7.5 cm Pak 40)* or heavy reconnaissance armoured vehicle equipped with a 75-mm *PaK 40* antitank gun had a camouflage made up of *Dunkelgelb, Rotbraun* and *Olivgrün* dark edged blotches. The paint was gun sprayed also using some stencils. This work was achieved by high-qualified workers in the factory premises. All vehicles produced there and from the same batch had their blotches located exactly the same place. It was attached to the *Stabskompanie* or Staff Company of the *Panzeraufklärungsabteilung* (reconnaissance armoured detachment) from *Panzerkorps "Feldherrnhalle"*. Apart from *Heer* registration numbers it had been only added the *Balkenkreuze*, one in each side of the hull and the other one in the rear. The inside part of the crosses is painted black.

Marder III Ausf. M (Sd.Kfz. 138), Pz.Jäg.Abt. 346, 346. Inf.Div., Holland, May 1945

The *346. Infanteriedivision* (346th Infantry Division) was formed in France in September 1942 and undertook occupation tasks (coast defence, security) until the D-Day landings in Normandy, then it was involved in such fierce combats that in August 1944 it got nearly annihilated. It retreated to Holland to be re-organised and combatted until surrendering in May 1945 in the north of Arnhem. *Panzerjägerabteilung 346* (346 tank destroyer battalion) was one of the units attached to the division. This late *Panzerjäger 38(t) auf 7.5cm Pak 40/3 Ausf. M (Sd.Kfz. 138) "Marder III"* belongs to it. The armoured vehicle shows the same camouflage scheme it had in Normandy. It was made up of *Olivgrün* blotches outlined with *Rotbraun*, gun sprayed onto a general coat of *Dunkelgelb.* The national emblems are placed under the tactical numbers in both sides of the casemate. There is a third cross located in the left rear side. Apart from these emblems there are thirty-two white rings painted in the gun barrel that matched thirty-two enemy vehicles destroyed. Notice, in the glacis, the name "Sofi" labelled in white using Gothic lettering.



Jagdpanther (Sd.Kfz. 173), material warehouse, Meppen, Germany, May 1945

The *Panzerjäger V Jagdpanther* was one of the best combat vehicles designed by the Germans during WWII. The one in the illustration is one among so many armoured vehicles reunited in a huge warehouse after Germany surrendered. The warehouse for captured material was located Meppen (Lower Saxony). It was a late model with some assembled steel plates over the fan tower in the engine deck (in order to protect them against shrapnel).

In accordance with the rule *Allgemeine Heeresmitteilungen 1945, Nummer 52*, dated on 2nd January, the tank destroyer is painted a general coat of *Olivgrün RAL 6003.* This green hue was mostly appropriated to hide the military vehicles in the forest areas full of vegetation. We must point out that the Allied Forces held the air supremacy and for a certain time the German Armed Forces had been fighting in a defensive position, stalking their enemies. The camouflage scheme is completed with narrow irregular bands painted *Rotbraun RAL 8017* slightly sloping on the armour and with so much empty space between the lines. This pattern along with the variants were usual among *Jagdpanther* and *Panther* built by MNH in 1945. The tank destroyer has no tactical markings except the national insignia located as usually (in both sides of the front part of the casemate and in the left case in the rear part of the hull).

CAMOUFLAGE SCHEMES

Fig. 1: **1914-1919**
Feldgrau

Fig. 2: **1916-1918**
Feldgrau/Ocker/Braun

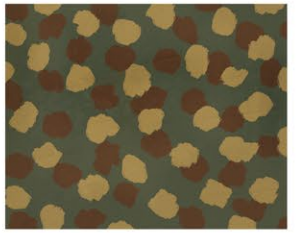


Fig. 3: **1916-1918**
Feldgrau/Ocker/Braun

Fig. 4: **1917-1918**
Feldgrau/Ocker-dark and light shades-*/Grün/Braun*

Fig. 5: **1918-1919**
Feldgrau/Ocker-dark and light shades-*/Braun*

Fig. 6: **1918-1919**
Feldgrau/ Ocker-dark and light shades-*/Braun/Schwarz*

Fig. 7: **1921-1941**
Feldgrau Nr. 3

Fig. 8: **1923-1933**
Erdgelb Nr. 17/Braun Nr. 18/ Grün Nr. 28/Schwarz Nr. 5

Fig. 9: **1933-1938**
Erdgelb Nr. 17/Braun Nr. 18/Grün Nr. 28

Fig. 10: **1937-1940**
Dunkelbraun Nr. 45/ Dunkelgrau Nr. 46

Fig. 11: **1939-1943**
Dunkelgrau RAL 7021

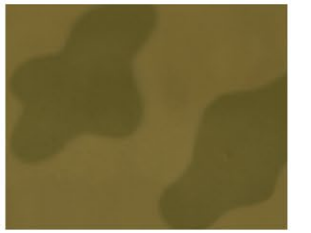


Fig. 12: **1941-1942**
Gelbbraun RAL 8000/ Graugrün RAL 7008

Fig. 13: **1941-1942**
Gelbbraun RAL 8000

Fig. 14: **1941-1943**
Dunkelgrau RAL 7021/ Grün RAL 6007

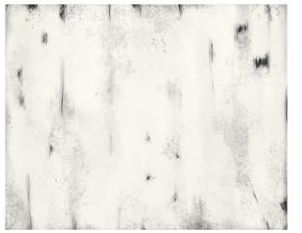


Fig. 15: **1941-1942**
Weiss RAL 9001

Fig. 16: **1942-1943**
Braun RAL 8020/ Grau RAL 7027

Fig. 17: **1943**
Dunkelgrau RAL 7021/ Dunkelgelb RAL 7028

Fig. 18: **1943-1945**
Dunkelgelb RAL 7028

Fig. 19: **1943-1945**
Dunkelgelb RAL 7028/Olivgrün RAL 6003/Rotbraun RAL 8017

Fig. 20: **1943-1945**
Weiss RAL 9002

Fig. 21: **1944-1945**
Dunkelgelb RAL 7028/ Olivgrün RAL 6003/ Rotbraun RAL 8017

Fig. 22: **1944-1945**
Rot RAL 8012/Dunkelgelb RAL 7028

Fig. 23: **1944-1945**
Olivgrün RAL 6003/ Rotbraun RAL 8017/ Dunkelgelb RAL 7028

Fig. 24: **1945**
Olivgrün RAL 6003

PANZERDIVISIONEN EMBLEMS, HEER

1. Pz.Div.
1940

1. Pz.Div.
2nd Semester 1940

1. Pz.Div.
Winter 1940-41

1. Pz.Div.
1941-42

1. Pz.Div.
1943-45

2. Pz.Div.
1939-40

2. Pz.Div.
2nd Semester 1940

2. Pz.Div.
1941-43

Pz.Rgt. 3
2. Pz.Div. 1941-42

Pz.Rgt. 3
2. Pz.Div. 1943

2. Pz.Div.
1943-45

3. Pz.Div.
1939-40

3. Pz.Div.
1940-45

3. Pz.Div.
Unofficial

3. Pz.Div.
Zitadelle, 1943

4. Pz.Div.
1939

4. Pz.Div.
1940

4. Pz.Div.
1940-43

4. Pz.Div.
Zitadelle, 1943

4. Pz.Div.
1944-45

Pz.Rgt. 35
4. Pz.Div.

Pz.Abt.z.b.V. 40
Spring 1940

Pz.Abt.z.b.V. 40
(Neubaufahrzeug)

5. Pz.Div.
1940

5. Pz.Div.
1941-45

5. Pz.Div.
Variant

5. Pz.Div.
Zitadelle, 1943

Pz.Rgt. 31
5. Pz.Div.

6. Pz.Div.
1940

Pz.Abt. 65
6. Pz.Div.

6. Pz.Div.
Sep.-Oct. 1941

6. Pz.Div.
1941-45

6. Pz.Div.
Zitadelle, 1943

6. Pz.Div.
Zitadelle, 1943

7. Pz.Div.
1940

7. Pz.Div.
1941-45

7. Pz.Div.
Zitadelle, 1943

8. Pz.Div.
1940

8. Pz.Div.
1941-45

9. Pz.Div.
1939-40

9. Pz.Div.
1940

9. Pz.Div.
Late 1940

9. Pz.Div.
1941-45

9. Pz.Div.
Temporary

10. Pz.Div.
1939-40

10. Pz.Div.
1940

Pz.Rgt. 8
10. Pz.Div. 1940

Pz.Rgt. 7
10. Pz.Div.

10. Pz.Div.
1941-43

11. Pz.Div.
1940-45

PANZERDIVISIONEN EMBLEMS, HEER

11. Pz.Div.
Unofficial

11. Pz.Div.
Zitadelle, 1943

11. Pz.Div.
Zitadelle, 1943

12. Pz.Div.
1940-45

12. Pz.Div.
Summer 1943

13. Pz.Div.
1940-45

14. Pz.Div.
1940-45

15. Pz.Div.
1941-43

15. Pz.Div.
Variant

Pz.Rgt. 8
15. Pz.Div.

Pz.Rgt. 8
Variant

DAK
1941-43

DAK
1941-43

16. Pz.Div.
1940-45

16. Pz.Div.
Variant

17. Pz.Div.
1940-45

10. Pz.Brig.
Zitadelle, 1943

18. Pz.Div.
1940-43

Pz.Rgt. 18, 1940-42
Pz.Abt. 18, 1942-43
18. Pz.Div.

19. Pz.Div.
1940-45

19. Pz.Div.
Zitadelle, 1943

20. Pz.Div.
1940-43

20. Pz.Div.
1943-45

20. Pz.Div.
Variant

Pz.Rgt. 20
20. Pz.Div.

5. le.Div.
1941

21. Pz.Div.
1941-43

21. Pz.Div.
Variant

21. Pz.Div.
Summer 1943

22. Pz.Div.
1941-43

23. Pz.Div.
1941-45

23. Pz.Div.
Unofficial

Pz.Rgt. 201
23. Pz.Div.

24. Pz.Div.
1941

24. Pz.Div.
1941-45

24. Pz.Div.
1943-45

25. Pz.Div.
1942-45

25. Pz.Div.
1942-45

25. Pz.Div.
1945

26. Pz.Div.
1942-45

26. Pz.Div.
Variant

27. Pz.Div.
1942-43

27. Pz.Div.
Temporary

116. Pz.Div.
1944-45

Pz.Lehr-Div.
1944-45

Pz.Lehr-Rgt. 130
Pz.Lehr-Div.

II./Pz.Lehr-Rgt. 130
Pz.Lehr-Div.

Führer Begleit Div.
1945

Führer Gren.Div.
1945

Pz.Div. Müncheberg
1945

PANZERGRENADIERDIVISIONEN EMBLEMS, HEER

3. Inf.Div.(mot.)
Until January 1943

3. Pz.Gren.Div.
1943-45

10. Pz.Gren.Div.
1943-45

15. Pz.Gren.Div.
1943-45

Pz.Gren.Rgt. 104
15. Pz.Gren.Div.
1943

Pz.Gren.Rgt. 129
15. Pz.Gren.Div.
1943

Pz.Abt. 115
15. Pz.Gren.Div.
1943

16. Inf.Div.(mot.)
1941-43

16. Pz.Gren.Div.
1943-44

18. Pz.Gren.Div.
1943-45

20. Inf.Div.(mot.)
Until June 1943

20. Pz.Gren.Div.
1943-45

22. Pz.Gren.Div.
"Luftlande"
1943-45

25. Pz.Gren.Div.
1943-45

25. Pz.Gren.Div.
Variant

29. Inf.Div.(mot.)
Until June 1943
29. Pz.Gren.Div. 1943-45

60. Inf.Div.(mot.)
Until January 1943
60. Pz.Gren.Div. 1943

Pz.Gren.Div. "FHH"
1943-45

Pz.Korps "FHH"
1945

90. Pz.Gren.Div.
1943-45

Pz.Gren.Div.
"Brandenburg"
1944-45

Pz.Gren.Div.
"Brandenburg"
Variant

Pz.Gren.Div.
"Kurmark"
1945

Inf.Div.(mot) "GD" until May 1943
Pz.Gren.Div. "Grossdeutschland" 1943-45

Pz.Gren.Div. "GD"
Variant

Pz.Gren.Div. "GD"
Variant

ARMOURED UNITS, LUFTWAFFE

Brig. "HG" 1942
Div. "HG" 1942-43

Pz.Div. "HG" 1943
Fsch.Pz.Div. 1 "HG"
1944-45

Fsch.Pz.Div. 2 "HG"
1944-45

Fsch.Pz.Korps "HG"
1944-45

ARMORED UNITS EMBLEMS, WAFFEN SS

SS-Div. "LSSAH"
1942

SS-Pz.Gren.Div.
"LSSAH" 1942-43

1. SS-Pz.Div.
"LSSAH" 1943-45

"LSSAH"
Zitadelle, 1943

SS-Pz.Gren.Div. "Das Reich" 1942-43
2. SS-Pz.Div. "Das Reich" 1943-45

"Das Reich"
Zitadelle, 1943

SS-Pz.Gren.Div. "Totenkopf" 1942-43
3. SS-Pz.Div. "Totenkopf" 1943-45

SS-Pz.Gren.Div. "Totenkopf"
Zitadelle, 1943

3. SS-Pz.Div.
"Totenkopf" 1943-45

4. SS-Polizei
Pz.Gren.Div. 1943-45

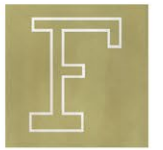
SS-Pz.Gren.Div. "Wiking" 1942-43
5. SS-Pz.Div. "Wiking" 1943-45

7. SS-Freiw.Geb.Div.
"Prinz Eugen" 1943-44

"Prinz Eugen"
Variant

SS-Pz.Gren.Div.
"Hohenstaufen" 1943
9. SS-Pz.Div. 1943-45

SS-Pz.Gren.Div. "Hohenstaufen" 1943
9. SS-Pz.Div. "Hohenstaufen" 1943-45



SS-Pz.Gren.Div. "Karl der Grosse" 1943
10. SS-Pz.Div. "Frundsberg" 1943-45

"Frundsberg"
Variant

"Frundsberg"
Variant

11. SS-Freiw.Pz.Gren.
Div. "Nordland"
1943-45

SS-Pz.Gren.Div. "Hitlerjugend" 1943
12. SS-Pz.Div. "Hitlerjugend" 1943-45

"Hitlerjugend"
Variant

16. SS-Pz.Gren.Div.
"Reichsführer SS"
1943-45

"Reichsführer SS"
Variant

"Reichsführer SS"
Variant

"Reichsführer SS"
Variant
1943-45

17. SS-Pz.Gren.Div.
"Götz von Berlichingen"
1943-45

18. SS-Freiw.Pz.Gren.
Div. "Horst Wessel"
1944-45

Key to vehicle identification, 1/180 scale

BIBLIOGRAPHY

ANGOLIA, John R. & SCHLICHT, Adolf. *Uniforms & Traditions of the Luftwaffe* (Vol. 3), R. James Bender Publishing, California, USA, 1998.

ARCHER, Lee & AUERBACH, William. *Panzerwrecks 1. German Armour 1944-45*, William Auerbach, New York, USA, 2004.

ARCHER, Lee & AUERBACH, William. *Panzerwrecks 4. German Armour 1944-45*, William Auerbach, New York, USA, 2007.

ARCHER, Lee & AUERBACH, William. *Panzerwrecks 11. Normandy 2*, William Auerbach, New York, USA, 2010.

BATTISTELI, Pier Paolo. "Panzer Divisions: The Blitzkrieg Years 1939-40", *Battle Orders* No. 32, Osprey Publishing, Oxford, UK, 2007.

BATTISTELI, Pier Paolo. "Panzer Divisions: The Eastern Front 1941-43", *Battle Orders* No. 35, Osprey Publishing, Oxford, UK, 2008.

BATTISTELI, Pier Paolo. "Panzer Divisions 1944-45", *Battle Orders* No 38, Osprey Publishing, Oxford, UK, 2009.

BLOCK, Martin, LIEVONEN, Jari & TERLISTEN, Detlev. "15cm sIG33/1 (Sf) auf GW 38(t) "Grille" (Sd. Kfz. 138/1) Part. 2: Ausf. H", *Nuts & Bolts* No. 26, Nuts & Bolts Verlag, Neumünster, Germany, 2010.

CHORÝ, Tomáš. *Camouflage Colors. Wehrmacht Heer, 1939-1945*, Aura Design Studio, Czech Republic, 2000.

DE LANNOY, François & CHARITA, Josef. *Panzertruppen, Les troupes blindées allemandes 1935-1945*, Editions Heimdal, Bayeux, France, 2001.

FLEISCHER, Wolfgang. "Military vehicles of the Reichswehr", *Schiffer Military/Aviation History*, Schiffer Publishing, Atglen, USA, 1996.

FRANK, Reinhard. "Trucks of the Wehrmacht", *German vehicles of World War II*, Schiffer Publishing, Atglen, USA, 1994.

JENTZ, Thomas L., *Panzertruppen, 1933-1942*, Schiffer Publishing, Atglen, USA, 1996.

JENTZ, Thomas L., *Panzertruppen 2, 1943-1945*, Schiffer Publishing, Atglen, USA, 1996.

JENTZ, Thomas L. & DOYLE, Hilary. *Germany´s Tiger tanks. VK45.02 to Tiger II: design, production*, Schiffer Publishing, Atglen, USA, 1997.

JENTZ, Thomas L. & DOYLE, Hilary Louis. "Panzerkampfwagen IV", *Panzer Tracts* No. 4, Darlington Publications, Maryland, USA, 1997.

JENTZ, Thomas L. & DOYLE, Hilary Louis. "Panzerkampfwagen I", *Panzer Tracts* No. 1-2, Panzer Tracts, Maryland, USA, 2002.

KOCH, Fred. *Beutepanzer im Ersten Weltkreig*, Podzun Pallas Verlag, Wölfersheim-Berstadt, Germany, 1994.

KUROWSKY, Franz. *Sturmgeschütze vor! Assault Guns to the Front!*, J J Fedorowicz Publishing, Manitoba, Canada, 1999.

LEDWOCH, Janusz. "Panzer IV/70", en *Militaria* no 152, Wydawnictwo Militaria, Warsaw, Poland, 2002.

MC. NAIR, Ronald. *Les Panzers. Les divisions de Panzers du Heer*, Editions Heimdal, Bayeux, France, 1991.

MC. NAIR, Ronald. *Les Panzers (2). Les divisions de Panzers SS et les bataillons indépendants*, Editions Heimdal, Bayeux, France, 1992.

MELLEMAN, Tadeusz. "Ferdinand Elefant vol. 1", *Gun power* No. 22, AJ-Press, Gdansk, Poland, 2004.

MOLINA FRANCO, Lucas & MANRIQUE GARCÍA, J. M. "Los hombres de von Thoma. El Ejército alemán en la Guerra de España 1936-39", *Colección Imker* vol. I, Quirón Ediciones, Valladolid, 2003.

MOSHANSKI, I. B. y STOYANOV, V. I. "Na Flangah Stalingrada 1942-1943", *Boziiaya Letopis*, PKV, Russia, 2002.

MUTHER, Alfred. *Das Gerät der leichten Artillerie vor, in und nach dem Weltkrieg*, Bernard & Graefe, Berlin, Germany, 1925.

PERRETT, Bryan & HADLER, Terry. "German Light Panzers 1932-42", *Vanguard* No. 33, Osprey Publishing, London, UK, 1983.

PERRETT, Bryan, CHAPPEL, Mike & BADROCKE, Mike. "Sturmartillerie & Panzerjäger 1939-45", *New Vanguard* No. 34, Osprey Publishing, Oxford, UK, 1999.

REGENBERG, Werner & SCHEIBERT, Horst. "Captured tanks under the German flag, Russian battle tanks", *Schiffer Military,* Schiffer Publishing, Pennsylvania, USA, 1990.

REGENBERG, Werner. "Captured American & British Tanks under the German flag", *Schiffer Military History*, Schiffer Publishing, Atglen, USA, 1993.

SCHEIBERT, Horst. "Deutsche schwere 6-Rad-Panzerspähwagen", *Waffen Arsenal* No. 89, Podzun Pallas Verlag, Dorheim, Germany, 1984.

SCHNEIDER, Wolfgang & STRASHEIM, Rainer. "Deutsche Kampfwagen im 1. Weltkrieg", *Waffen Arsenal* No. 112, Podzun Pallas Verlag, Dorheim, Germany, 1988.

SCHNEIDER, Wolfgang. *Tigers in combat I*, J.J. Fedorowicz Publishing Inc., Manitoba, Canada, 1994.

SCHNEIDER, Wolfgang. *Tigers in combat II*, J.J. Fedorowicz Publishing Inc., Manitoba, Canada, 1998.

SPIELBERGER, Walter J. "Die Halbketten-Fahrzeuge des Deutschen Heeres 1909-1945", *Militärfahrzeuge* No. 6, Motorbuch Verlag, Stuttgart, Germany, 1993.

SPIELBERGER, Walter J. "Sturmgeschütze, Entwicklung und Fertigung der s PaK", *Militärfahrzeuge* No. 13, Motorbuch Verlag, Stuttgart, Germany, 1994.

STRASHEIM, Rainer & HUNDLEBY, Max. "Sturmpanzer A7V, First of the Panzers", *Tankograd-World War One* No. 1001, Jochen Vollert-Tankograd Publishing, Erlangen, Germany, 2010.

TERLISTEN, Detlev. "Kanonenwagen Sd.Kfz. 251/9 Stummel", *Nuts & Bolts* No. 21, Nuts & Bolts Verlag, Neumünster, Germany, 2008.

THOMAS, Nigel & EMBLETON, Gerry. "The German Army in World War I (1) 1914-15", *Men at Arms* No. 394, Osprey Publishing, Oxford, UK, 2003.

TIQUET, Pierre. "La Flak de la Hohenstaufen, 9. SS-Panzer-Division", *Magazine 39-45 Hors–Série & Batailles Temoignages*, Editions Heimdal, Bayeux, France, 2012.

TOUZIN, Pierre & Vauvillier, François. "Les canons de la Victoire 1914-1918", *Les matériels de l`Armée française* No. 3, Histoire & Collections, Paris, France, 2006.

TROJCA, Waldemar. "Pz.Kpfw. V Panther vol. 2", *Tank power* No. 2, AJ-Press, Gdansk, Poland, 1999.

Different Authors. *Tiger Tank Panzerkampfwagen VI Tiger Ausf. E (Sd.Kfz. 181)*. Owners´ Workshops manual, The Tank Museum-Haynes Publishing, Somerset, UK, 2011.

ZALOGA, Steven J. Blitzkrieg. *Armour camouflage and markings. 1939-1940*, Arms and Armour Press, London, UK, 1990.

ZALOGA, Steven J. & DELF, Brian. "German Panzers 1914-18" *New Vanguard* No. 127, Osprey Publishing, Oxford, UK, 2006.

PANZERWAFFE TARNFARBEN

Camouflage Colours and Organization of the German Armoured Force (1917-1945)

During the Great War, the assault tanks in the German units merely played an anecdotal role. Due to the restrictions enforced by the Treaty of Versailles, the first training unit for armoured forces wasn't organised (secretly) until 1933. The existence of the first three *Panzerdivisionen* of that new German Army was officially revealed in 1935. The armoured troops or *Panzertruppen* were an independent branch of the Army, with their own command. This allowed concentrating the tanks in divisions so units were capable of significantly strategic deployments. General Heinz Guderian forged both words: *Panzerwaffe* to refer to the armoured force and *Panzertruppen* to identify the elitist armoured troops which would conquer half of Europe in the following years.

The evolution of the camouflage schemes painted in tanks and vehicles of German armoured units is analysed in the book along with the organisation of these German units during WWI and WWII and for the whole interwar period.

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